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THE DIFFERENTIAL DIAGNOSIS BETWEEN BRAIN ABSCESS AND SINUS THROMBOSIS, AND THE TREATMENT OF THESE CONDITIONS.[1]

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I desire to speak to you in the time allotted me upon a subject of the utmost importance. I am going to ask you to give me your attention while we consider some of the intracranial conditions which may follow a middle-ear suppuration. The time is too short for me to consider the entire subject of the intracranial complications of middle-ear suppuration, and I would therefore call your attention to but two of the sequelæ which may follow a suppurative process within the middle ear, namely, the development of an abscess within the brain substance or a thrombosis of the lateral sinus.

The frequency with which intracranial complications occur in middle-ear suppuration is rather astonishing. In some statistics which I compiled a number of years ago, of 10,000 cases of middle-ear suppuration, it was found that one patient in every 88 suffered from some intracranial complication. The importance, therefore, of always bearing in mind the possibility of involvement of the cranial contents in every case of middle-ear suppuration cannot be too forcibly impressed upon a body of medical men.

The differential diagnosis between various intracranial complications is one fraught with considerable difficulty, and I am going to call your attention this morning to some points which enable us to differentiate between two of the most important of these lesions, namely, abscess of the brain and sinus thrombosis. In order to bring out clearly the differential points, it will be well to consider the two conditions separately, and then to emphasize their points of differentiation.

Remember that in brain abscess we have two sets of symptoms—first, those depending upon a localized collection of pus, and secondly, certain localizing symptoms, dependent upon the particular situation of this purulent focus. Those symptoms depending upon a localized collection of pus stages: (1) the stage of infection or priusually express themselves in three distinct mary involvement; (2) the latent stage; and (3) the terminal stage. When the brain substance, either of the cerebrum or the cerebellum, becomes infected, the first symptoms are those which might characterize the infection of any of the soft structures in any part of the body—that is, we have a sudden and abrupt rise of temperature, an increase in the pulse-rate, and a certain amount of general malaise. The temperature ranges ordinarily from 101° to 103°, seldom higher than the latter figure, and the pulse-rate is usually proportionate to the temperature elevation.

This rapid pulse-rate is present only in the early stages. Even in an acute abscess the rapid pulse is soon succeeded by a slow pulse, and this, I think, is one of the important signs which enable us to differ-

[1] A lecture delivered before the Senior Class of the Jefferson Medical College, Philadelphia, March 25, 1912.

entiate a brain abscess from some of the other intracranial complications.

These symptoms are present whether the cerebrum or the cerebellum is affected.

Confining ourselves for a short time exclusively to these general symptoms, we will find that in cases unrecognized in this early stage, this temperature will persist for from two to ten days; then the temperature will gradually subside, the pulse will become less frequent, and a period of latency will ensue, during which time the temperature will remain either approximately normal or even subnormal, and the pulse-rate will be either normal or reduced in frequency. This latent stage of a brain abscess may last either a few weeks or may continue for a number of years. Following this we have the terminal stage, in which the symptoms may be either local, depending upon the presence of the abscess within the cranial cavity, or general, depending upon a sudden rupture of the focus into the ventricles, and a diffusion of the septic material into the general circulation.

Going into the symptomatology of brain abscess more in detail, there are certain signs which are indicative of intracranial inflammation, no matter where this inflammation is located. These are headache, vomiting, muscular paralyses, and choked disk. All of these symptoms may depend upon the presence of an inflammatory lesion within the cranial cavity, and yet do not enable us to determine either the location or the nature of the intracranial inflammation. Headache is a symptom which is present in all cases of brain abscess, and if persistent is one which must be looked upon with suspicion in every case of middle-ear suppuration. A persistent headache, in a case of acute inflammation of the middle ear, always suggests to me the possibility of early intracranial involvement. In brain abscess, either in the early or latent stage, this headache may not be severe. In the early stages it is apt to be of considerable severity. One feature which characterizes headache, due to brain abscess, is that while not severe enough to make the patients complain of excruciating pain, it is usually severe enough to keep them awake at night, and this symptom is one of the earliest and one of the most significant symptoms of brain abscess. It occurs with its greatest severity in the initial stage, but persists through the latent stage, and again becomes severe in the terminal stage.

Vomiting is a symptom of great importance in the initial and terminal stages of brain abscess, and is one which should always be considered as an important diagnostic sign. It is present in about 50 per cent of the cases.

The muscular paralyses which occur in cases of brain abscess depend naturally upon the location of the purulent focus. While the reports of a large number of post-mortem examinations seem to show that cerebellar abscesses, of otitic origin, are more common than abscesses in the cerebral hemispheres, clinically this ratio is reversed, and most clinicians will report that a temporosphenoidal abscess, of otitic origin, is about twice as frequent as is cerebellar abscess. The muscular paralyses which occur are usually those involving the ocular muscles. The sixth nerve is the nerve most usually affected, owing to its peculiar position. This nerve, as you will remember, runs across the apex of the petrous pyramid, and consequently could easily be involved, either in cases of temporosphenoidal abscess or in cases of cerebellar abscess, situated near the cerebellopontine angle. Abducens paralysis, then, is a symptom which should always make one suspicious of a purulent focus within the brain.

A sign of considerable importance in these cases is the presence of an optic neuritis, either beginning or fully developed. In any case of suspected intracranial lesion, or, in fact, in any case of suppurative otitis media, with or without mastoiditis, in which headache persists, and the temperature is elevated, a careful examination of the ocular fundus should always be made, in order to reveal early symptoms of beginning choked disk.

Next we come to various localizing

symptoms. Where a brain abscess involves the left temporosphenoidal lobe, certain localizing symptoms appear, which render the recognition of the abscess comparatively easy; that is, in these cases we usually have a characteristic aphasia. Patients suffering from this condition are unable to name objects presented to them for inspection. For instance, the patient is shown a watch. He is unable to name the object, but will name its use, saying that "it is something to tell the time by." Shown a key, patient will say, "something to unlock the door with." A match is "something to strike a light." A cigar is "something to smoke." Never, however, is the object named, although its use is clearly defined by the patient. In certain of these cases the patients are unable to write, or, if they do write, the writing will be found to be mirror-writing—that is, their writing is absolutely unintelligible until looked at with a mirror, when the words appear clearly. One case of this kind came under my own observation, in which the symptom of mirror-writing was exceedingly well marked. Sometimes these abscesses are located in parts remote from the ear. One of these cases which I am certain was of many years' duration, and was simply lighted up to renewed activity by a middle-ear inflammation occurring ten years after the primary attack, was located in the island of Reil, and gave rise to the characteristic "jargon aphasia," which is indicative of involvement of this particular region of the brain.

Perhaps the citation of a single case, occurring recently, may serve to fix the picture of an acute brain abscess more clearly in your memory. This patient was a young girl who had suffered from a chronic middle-ear suppuration for a number of years. She came into the hospital complaining of an acute exacerbation of this chronic purulent otitis. The left mastoid was tender, and there was profuse discharge from the left ear. The patient also had considerable headache, and had an elevation of temperature of about 101°. A radical operation was performed the day following her admission to the hospital, and a discolored area of dura was exposed in the middle fossa. As the temperature had not been high the dura was not incised, as the pachymeningitis present seemed to account fully for the headache. This patient's temperature continued to be elevated between 101° and 102°; she vomited considerably after her anesthetic, and this vomiting persisted for about three days. Her headache continued, and she seemed very ill. On the fourth day after the operation a careful examination revealed the characteristic aphasia. The temperature was then about 101°. The girl was somewhat dull, but not unconscious. The pulse had gradually fallen in frequency, from about 96 at the time of admission to 48 on the fourth day. There was beginning choked disk upon the affected side. Rapid operation revealed a temporosphenoidal abscess, which was evacuated, and the patient made a perfect recovery.

While these symptoms are characteristic of an abscess located in the left temporosphenoidal lobe, we must remember that an abscess in the right temporosphenoidal lobe will give rise to no aphasic symptoms. The right temporosphenoidal lobe has properly been called the "silent" lobe of the brain, and here we must depend entirely upon the symptoms of temperature, headache, first a rapid and then a slow pulse, to enable us to make the diagnosis.

When the abscess is located in the cerebellum, there are certain symptoms which aid us in making the diagnosis. In cerebellar abscess disturbances of equilibrium are frequently present. The patient tends to fall to the affected side. In cerebellar abscess the infection usually takes place through the internal auditory meatus, the port of entry of the infection being either one of the semicircular canals, or the round or oval window. In other words, a purulent labyrinthitis frequently precedes the development of a cerebellar abscess. If the case has been under observation for a sufficient length of time, these labyrinthine symptoms have undoubtedly excited attention—that is, the patient has

complained of vertigo, vomiting, profound deafness, and has probably developed nystagmus, the quick movement of the eyes being toward the healthy side. Later such a patient will still complain of the vertigo and nausea, but the nystagmus will then be directed toward the diseased side. It is important in every case of aural suppuration to examine the eyes for this one symptom of nystagmus. For instance, a patient presents with aural suppuration. There is some vertigo, and the patient has a nystagmus toward the right, the left ear being the seat of the suppuration. The vertigo may improve, and all of the symptoms may partially or completely disappear, but after a time the patient will complain of headache, a recurrence of the symptoms, and the nystagmus will be directed toward the diseased side—that is, toward the left side. This is strongly indicative of a suppurative lesion within the cerebellum.

We have now considered the symptomatology of abscess of the brain. Let us now take up the symptomatology of thrombosis of the lateral sinus, as the object of this short talk is to enable us to differentiate between these two conditions.

A sinus thrombosis is a general systemic infection, due to the introduction into the circulation of a specific poison through the avenue of the lateral sinus. First, remember some of the anatomical points regarding the lateral sinus. The lateral sinus is a large blood-vessel traversing the mastoid portion of the temporal bone, beginning above at the torcular Herophili, and terminating below in a large dilatation of the venous channel commonly called the jugular bulb. The situation of the lateral sinus and of the jugular bulb varies considerably in different subjects. Normally, the lateral sinus lies about one-half inch behind the posterior wall of the external auditory meatus. In this position it runs through the posterior portion of the mastoid, and may be entirely beyond its cellular structure. In quite a number of cases the lateral sinus, while it occupies this position, is completely surrounded by pneumatic cells. In other subjects the sinus may lie far forward, in extreme cases so far forward as to actually impinge upon the posterior wall of the bony external auditory meatus. In this situation it may overlie the mastoid antrum. In some cases it lies at a lower level than the superficial portion of the mastoid antrum.

The jugular bulb also presents certain anomalies; in some instances the dome of the jugular bulb is exceedingly high, and it may encroach upon the floor of the tympanic cavity and of the deeper portion of the external auditory meatus. Ordinarily, the dome of the jugular is covered with firm bone. In certain instances, however, dehiscences occur in this bony covering, so that the bulb of the jugular lies exposed in the floor of the tympanic cavity. It is easy to understand, therefore, how, in cases of middle-ear suppuration, infection either of the lateral sinus or of the jugular bulb may occur through one of two avenues: first, and most usually, through the wall of the lateral sinus as it passes through the mastoid process; secondly, and less frequently, but by no means rarely, through the dome of the jugular, by direct infection from the middle ear, without any previous mastoid involvement.

The pathology of the condition is interesting, in that we first have an infection of the wall of the sinus or of the wall of the bulb, as the case may be. The vessel walls become infected with the organism causing the middle-ear suppuration, and as the result of this infection the wall becomes infiltrated with inflammatory products. Gradually the inner wall of the vessel becomes involved, and a parietal clot is formed. If this clot increases in size it may become large enough to entirely close the lumen of the vessel. On the other hand, the clot may remain parietal, and still cause systemic symptoms. During the period of formation of the clot few or no symptoms may be present. After a certain length of time, however, this septic clot begins to break down, and this occurs whether the thrombus is complete or whether it is incomplete or parietal. As the clot breaks down certain quantities of

septic material are thrown into the general circulation, and these produce systemic symptoms.

The most characteristic symptom of a septic thrombus within the lateral sinus or jugular bulb is a sudden elevation of temperature. The temperature rises rapidly from normal, or from a point slightly above normal, to 104° or 105° or even 106°, the temperature being relatively higher in young subjects than in adults. This rise in temperature attains its maximum in the course of two to six hours, and then occurs a spontaneous fall, either to normal or to 100° or 101°. The fall in temperature is usually quite as rapid as the rise. Often at the end of from eight to twelve hours after the beginning rise the temperature is normal or nearly so, and then a second rise follows, this being an indication of a second amount of poison being thrown into the general circulation, due to further disintegration of the thrombus. This second rise in temperature is followed by a second fall, and these remissions in temperature occur once or twice in twenty-four hours, as the case progresses. Occasionally the poison is thrown into the general circulation so rapidly that the remissions in temperature may be insignificant—that is, the temperature may remain persistently between 105° and 103°, the systemic infection occurring so rapidly as to give us a sustained high temperature, with only slight remissions.

These are the characteristic temperatures of a sinus thrombosis, and this sign alone is sufficient to enable one to make a diagnosis in the very large majority of cases. Other symptoms which would enable us to recognize this condition are characterized by their absence. In other words, we have a patient whose general condition seems very satisfactory, excepting that once or twice within the twenty-four hours there will be an abrupt rise in temperature to 104° or 105° or 106°, with a remission of greater or less extent, followed again by the same cycle of symptoms. These patients do not seem to be ill. The sensorium is almost always clear, the patients complain of no discomfort at all, excepting perhaps of slight headache when the temperature is at its height, and rather profuse perspiration when the temperature begins to fall.

A number of authors state that these rises in temperature are usually accompanied or followed by severe chills. In a large number of cases of sinus thrombosis which have come under my observation, quite as many patients have had no rigor as have presented this symptom. The pulse is always rapid when the temperature is high, the pulse-temperature rate being sustained at about a normal ratio. The tongue is usually dry and heavily coated. Pain is seldom present, excepting the slight headache, above alluded to.

If the case is allowed to go on untreated, the thrombus gradually extends to the internal jugular vein, and then certain other symptoms make their appearance. The patient may then complain of slight pain in the neck, and in a small proportion of cases I have seen a torticollis present, although this is rather an unusual symptom. Palpation of the neck reveals some tenderness along the course of the internal jugular vein, and enlargement of the glands along the anterior border of the sternomastoid muscle. This is a most important sign; it is present in the very early stages, and is one which should not be overlooked.

Extension of the clot into the internal jugular is said by some authors to be characterized by the presence of a cord-like swelling along the anterior border of the sternomastoid muscle, following the course of the internal jugular vein. I have never, in a single instance, been able to map out this cord-like swelling, although I have seen several cases in which at operation the jugular was filled with a clot.

Glandular enlargement is a symptom of much greater importance than is the presence of any cord-like swelling along the anterior border of the sternomastoid muscle.

If the process progresses still further, or sometimes even before jugular involvement, septic emboli may lodge in some of

the viscera, and give rise to symptoms dependent upon the particular organ in which they lodge. The pulmonary tissue is the favorite site of lodgment of such an embolus, giving rise to a septic pneumonia. Next in frequency come the joints, next the brain, then the liver, and later the gastrointestinal tract. Emboli lodging in these different viscera give rise to symptoms so characteristic that it is not necessary for me to recount them here in detail.

One sign which I have not mentioned, and which is of not infrequent occurrence, is the presence of choked disk.

This sign, the choked disk, as you will remember, also occurs in cases of brain abscess—in fact, may be present in any intracranial complication of otitis media.

The value of the differential blood count in these cases is exceedingly problematical. I have seen very few cases of sinus thrombosis in which the polymorphonuclear percentage was elevated. I have seen a few of these cases in which the polymorphonuclear per cent was over 80, but in the majority of cases it has only been elevated, say between 75 and 80 per cent, and in only one case that I remember did it reach 85 per cent.

In recent years much has been written upon the value of the blood culture, as a diagnostic sign, in cases of sinus thrombosis. When in a case of acute or chronic otitis media, either accompanied or unaccompanied by mastoiditis, a specific organism such as the streptococcus is found in the blood, we have a sign of the utmost value as confirming our diagnosis of a septic sinus thrombosis. Unfortunately, however, a positive blood culture is not always present in cases in which a septic thrombus is present in the lateral sinus. Where a positive blood culture exists, it is of the greatest diagnostic importance, and practically clinches the diagnosis absolutely. The absence of a positive blood culture, however, by no means excludes the presence of a septic thrombus within the lateral sinus. This is a point of the utmost value, and one which must not be forgotten. Clinical signs of sinus thrombosis should always outweigh a negative blood culture. Moreover, the vessel from which the blood is drawn is of considerable value. In one case which came under my observation the blood culture from the median vein was negative, although the vein was so small as to render the culture somewhat unsatisfactory. Blood culture from the sinus was positive, and the patient recovered after appropriate operative interference.

We next come to the differential diagnosis between the disease just considered and the one previously considered—that is, brain abscess. The two pictures are so distinct that it is hardly possible for an error in diagnosis to occur. In brain abscess we have a moderate temperature in the early stages, then a period of latency, and then a terminal stage of high temperature, or of low temperature, with cerebral symptoms so marked as to impress themselves upon even the most superficial observer.

The general symptoms in sinus thrombosis are trivial, and the temperature is practically the sole guide. A differential blood count may aid in a diagnosis in that, if the polymorphonuclear percentage is high, we might suspect a sinus thrombosis. In the majority of my cases, however, the polymorphonuclear percentage has not been very much elevated. I remember one case only in which the polymorphonuclear percentage was over 80. In brain abscess, on the contrary, the polymorphonuclear percentage is frequently 80 or over. The characteristic difference in temperature, therefore, the absence of cerebral symptoms in sinus thrombosis and their presence in cases of cerebral abscess, the rapid pulse-rate in sinus thrombosis and the slow pulse-rate in every stage of cerebral abscess, except the early stage, ordinarily render a differential diagnosis comparatively simple.

Blood culture in cases of sinus thrombosis is frequently positive, and where it is positive it makes the diagnosis perfectly certain. Negative blood culture, while not excluding sinus thrombosis, would be expected in cases of brain abscess.

Certain cases may occur in which, for instance, a cerebellar abscess is secondary to a sinus thrombosis. These cases, of course, are confusing, and a differential diagnosis may not always be possible.

When we come to the treatment of these conditions, we must remember that once the diagnosis of either condition is made, operative interference is the only plan which offers the patient the least hope of recovery. In cases of cerebral abscess, as soon as the diagnosis has been made immediate operation should be resorted to. In cases in which the abscess can be localized—that is, in cases of temporosphenoidal collections of pus—the operative procedure which has been followed by the best results is to attack the focus of suppuration along the path of infection; in other words, the operator should discover, if possible, the route by which the infection has traveled to the brain substance. Frequently, at the time of the original mastoid or radical operation, a discolored area of dura will have been seen, and when such an area has been found, the best results will be obtained by opening the abscess through the infected dura. Formerly I was an ardent advocate of opening these abscesses in every case above the zygoma, through the normal brain substance. Experience has taught me, however, and this experience is confirmed by other observers, that the best results will be obtained by making a wide dural exposure comprising the original infected area of dura. In other words, if we have an area of infected dura over the tegmen tympani, the bone should be removed about this area in every direction so that the dura is exposed over a space of at least an inch and a half, or better, two inches. An incision into the brain substance, through the portion of dura involved, will ordinarily enter the abscess cavity. My own plan of procedure is to incise the dura over the suspected area with a scalpel, and then introduce a director into the brain substance. Aspiration of the abscess cavity, for exploratory purposes, is absolutely useless as the pus is ordinarily too thick to flow into the aspirating needle, and the same objection applies to the use of the knife in the brain substance. After incision of the dura a director passed into the brain will frequently evacuate a few drops of pus, the fluid following the groove in the director. When this occurs the incision in the dura should be enlarged, and a narrow, thin-bladed retractor should be passed along the director until it enters the abscess cavity. The director may then be withdrawn and a second retractor passed along the first. By separation of these two retractors the abscess will be completely evacuated. Care must be taken not to allow the pus to flow too rapidly, as this will interfere with intracranial pressure, and may be followed by a cerebral hemorrhage. The pus should be allowed to flow rather slowly, or its flow should be stopped from time to time, in order to allow a reëstablishment of the normal intracranial pressure. After the abscess has been thoroughly evacuated, a cigarette drain should be passed into the cavity, the surrounding dura be covered with iodoform gauze, and an antiseptic dressing applied.

This same technique should be followed in dealing with cases of cerebellar abscess. In opening a cerebellar abscess, as most of the infections occur by way of the internal auditory meatus, it is well to first attempt evacuation of the abscess by an incision in the cerebellar substance in front of the lateral sinus, in those cases in which the sinus is placed far enough backward to permit of such an incision. In many instances, however, the sinus is placed far forward, and in these cases it will only be possible to evacuate the cerebellar collection of pus by an incision into the cerebellar substance behind the lateral sinus.

In some cases the location of a cerebellar abscess my be such that although the abscess may be entered in front of the lateral sinus, it is impossible to drain the abscess thoroughly through this opening. Under these conditions it may be necessary to make a counter-opening through the cerebellar substance, dura, and bone, behind the lateral sinus, and secure through-and-

through drainage of the abscess. In one case coming under my observation, in which this plan was advised and followed, the patient made a complete recovery. In another case coming under my own observation in which the plan was tried, it was unsuccessful. The employment of a counter-opening is particularly applicable to those cases in which the cerebellar abscess is of considerable size, and lies close to the inferior border of the lateral sinus. Here the probe introduced into the abscess cavity passes almost directly downward, and if the abscess is of considerable size the cavity cannot be thoroughly evacuated by a drain placed in front of the lateral sinus, no matter in what position the patient's head is maintained. Where a counter-opening is necessary, it seems to me wiser to expose the cerebellar meninges by a separate incision behind the lateral sinus, and then after incision of the dura to make the counter-opening on the point of a probe passed into the abscess cavity through the cerebellar substance, downward and outward against the dura. My reason for making a second opening in this manner, rather than uncovering the lateral sinus through the original incision, is that if the plan advised is followed, severe hemorrhage from the mastoid emissary vein is avoided. This hemorrhage is always troublesome and prolongs the operation. If, however, the cerebellum is exposed posteriorly to the emergence of the mastoid emissary, the counter-opening can be made very quickly and without troublesome hemorrhage.

In cases in which incision of the dura, either in the cerebellar or middle cranial fossa, fails to reveal the presence of pus, I am in favor of a large removal of bone over the suspected area and a free crossed incision of the dura—in other words, of performing a decompression operation over the affected part. The subdural space is then packed with iodoform gauze, and in this way the subdural space is obliterated. Moreover, the collection of pus within the brain substance will naturally tend to travel in the direction of least resistance, and at the end of twelve or twenty-four hours after the decompression operation, incision of the brain substance may enable the operator to evacuate the purulent focus which could not be discovered at the time of primary operation. Evacuation of the abscess at this period will not be followed by a meningitis because the subdural space has been thoroughly walled off. If an abscess is evacuated through healthy brain substance, after incision of healthy dura, the danger of general meningeal infection is great, and it has been our experience that in many cases in which the abscess has been successfully evacuated the patients have subsequently died of acute purulent meningitis. This unfavorable result may, I believe, be avoided by evacuating the abscess by a two-stage operation, as suggested.

In the treatment of sinus thrombosis, as soon as the diagnosis has been made, surgical intervention should be at once instituted.

In the early stages of sinus thrombosis it may be sufficient simply to open the lateral sinus and evacuate the clot. This procedure necessitates an exposure of the sinus over a length of, at least, an inch in adults, and better still, over a length of an inch and a half. In other words, the sinus should be exposed from just beyond the knee to a point as near to the jugular bulb as possible. Careful examination of the sinus prior to opening the vessel is advisable. It is practically impossible to determine by palpation whether or not a clot is present. If the vessel is completely filled by a thrombus, its recognition may be comparatively simple, although I have palpated sinuses which seemed to contain fluid blood, and which upon exploration were found to contain a clot. In examining the sinus, prior to incision, it is well to first place a pledget of sterile gauze between the overlying bone and the lateral sinus at the torcular extremity of the exposed area. This will shut off the blood from the torcular, and if the sinus contains no clot, it should naturally empty itself into the jugular bulb. If the bulb is ob-

structed, the sinus will not empty itself; in other words, it will not become flattened after the gauze plug is placed in position. In the same way, if a pledget is placed between the sinus and the overlying bone, at the jugular extremity of the exposed vessel, if the sinus is free, it will become filled with fluid blood from the torcular and present as a distended vessel in the wound, and this distention will immediately disappear when the plug below is removed. All of these signs are theoretically perfect, but practically admit of many exceptions. There may, for instance, be a parietal clot in the sinus, sufficient to cause symptoms of general septic absorption, and yet not sufficient to interfere greatly with the free passage of the blood through this venous channel. In cases of this kind the shutting off alone of the circulation from the upper and lower portions of the sinus will give negative results. Sufficient blood may flow through the sinus to cause its distention when firm pressure is exerted upon the vessel below, or to cause its collapse when its lumen is occluded by pressure above, in spite of the presence of a parietal clot of considerable size.

Exploratory puncture of the sinus by means of the aspirating needle is also without value for the reason already suggested, that a parietal clot not occluding the lumen of the vessel may be present, and may be able to give rise to systemic infection. The exploring needle might pass either completely through the clot or might miss it altogether, and fluid blood might be obtained as the result of the procedure, in spite of the presence of a parietal clot. The only logical method of procedure, in a case in which the diagnosis of sinus thrombosis is reasonably certain, is to first shut off the circulation from the torcular end of the sinus by a firm packing introduced between the sinus and the overlying bone, and to incise the sinus wall. If free hemorrhage takes place from below, we are certain that no obstructive clot is present in the jugular bulb. Moreover, if a parietal clot were present in the bulb, it would probably be washed out by the blood current, consequently an incision is of distinct therapeutic value. After incision of the sinus, assuming that there is free hemorrhage from below, the return current from below should be cut off by the insertion of a pledget of gauze between the lower end of the sinus and the overlying bone, while the pledget of gauze obliterating the upper end of the sinus should be removed. Free hemorrhage from the torcular extremity will demonstrate the patency of the sinus in this direction, or if a parietal clot is present, will probably wash out this parietal clot. After opening the lateral sinus, if free hemorrhage does not occur either from the torcular extremity or from the portion of the sinus lying close to the bulb, the operator should then proceed to remove the obstructive thrombus. If this thrombus lies in the torcular portion of the sinus, the vessel should be uncovered backward toward the torcular, and the incision in the sinus wall extended far enough to enable the operator to completely remove the clot by means of a curette introduced into the lumen of the sinus. It is not necessary in every case to incise the sinus wall in the direction of the torcular, to the extreme limit of the clot. The sinus should be uncovered in the direction of the torcular until the sinus wall seems healthy; then the cautious introduction of the curette will enable the operator to extract the clot and secure free hemorrhage, without the removal of an undue amount of bone. The operator should never desist from his exploration, however, until free hemorrhage is obtained from the torcular end of the sinus. As soon as such free hemorrhage occurs, it should be allowed to continue for a brief period, perhaps for a couple of seconds, so as to thoroughly wash out all septic thrombi by means of the force of the blood current. Hemorrhage is then checked by introducing a packing either of iodoform or sterile gauze between the sinus wall and the overlying bone.

In dealing with the lower extremity of the sinus, two methods of procedure are available. It must be remembered that free hemorrhage from below does not, of neces-

sity, demonstrate the absence of a parietal clot in the jugular bulb, owing to the fact that hemorrhage from below in these cases comes chiefly from the inferior petrosal sinus. The jugular bulb is of considerably greater diameter than is the inferior petrosal sinus, consequently a clot may be present in the bulb, and yet the petrosal sinus may be perfectly free. Under these circumstances systemic infection might very well take place, and still the sinus might bleed freely from below when opened. With the evidence of systemic infection, therefore, it is permissible to place a ligature about the internal jugular vein in the neck, prior to investigating the lower portion of the sinus, provided the presence of a clot has already been demonstrated in the upper portion of the sinus. Personally I am in favor of applying the same rules to the lower extremity of the sinus as I have already suggested as being applicable to its upper or torcular end—that is, to evacuate any clot which may be present in the lower portion of the sinus by means of the curette before interfering with the jugular. This procedure is attended with a certain amount of danger, because if the sinus and jugular are perfectly free, curettage of the lower extremity of the sinus may, even in careful hands, be followed by the aspiration of air into the vessel, and the sudden death of the patient by an air embolus. If care is taken to apply pressure over the internal jugular vein at the time that the lower end of the sinus is investigated, such an accident, I think, will never happen. Whether, therefore, the jugular be ligated in the neck prior to exploring the lower end of the sinus, or whether the lower end of the sinus should be explored before interference with the jugular, must, I think, depend upon the severity of the symptoms. Given a case in which there is an infection of moderate severity, as indicated by a rise in temperature to 104°, but not over this, with a negative blood culture, and the presence of a clot in the sinus, I feel inclined to simply evacuate the clot from the lateral sinus itself, securing free hemorrhage both from above and from below, and to then wait for further symptoms. In many cases this simple turning out of the clot from the sinus will be followed by an absolute cessation of all symptoms, and a complete recovery of the patient. On the other hand, if the symptoms of general sepsis are severe, as indicated by a very high temperature, to 105° or 106°, and considerable prostration, I then believe that it is wise to place the ligature about the jugular prior to interference with the lower end of the sinus.

The blood culture is of considerable value in all of these cases in enabling the surgeon to decide as to whether or not the internal jugular vein should be interfered with. A positive blood culture in these cases should always cause the surgeon to decide in favor of jugular excision, rather than of interference limited to the sinus alone. It may be stated almost as a rule that in cases of mild infection, with a negative blood culture, and with an obstructing thrombus, evacuation of the clot from the sinus alone may be looked upon as a procedure which will probably be radical enough. With a positive blood culture, however, interference with the sinus alone will probably never be sufficient, and the surgeon must in these cases not only evacuate the clot from the sinus, but must also remove the vein.

Another class of cases present themselves in which, upon opening the sinus, we find that it contains fluid blood—that is, we have free hemorrhage both from the torcular and from the bulbar end of the sinus, and yet we have symptoms of profound sepsis. In these cases we have undoubtedly to deal with a parietal clot, and the jugular should always be excised from a point low down in the neck to a point just below the base of the skull, in spite of the fact that the sinus appears perfectly patent. In such instances we have evidently to deal with a parietal clot, which is causing a severe systemic infection, and the only way in which we can eliminate this systemic infection is to shut off the avenue through which this infection occurs, namely, to excise the internal jugular

throughout a considerable portion of its extent. In some of these patients the vein will be found thrombosed. In every instance the ligature must be passed about the vein below the level of the thrombus, and in all cases I believe it is wise to excise the vein from a point not higher up than the level of the omohyoid muscle. In this operation the common facial trunk is ligated and divided between two ligatures. This is the only important tributary to the internal jugular, although certain smaller veins, such as the thyroid and laryngeal, may require ligation during the course of the operation.

Certain authors have advocated ligation of the jugular rather than excision, and many convincing cases have been reported in support of this procedure. Where the vein is simply ligated and not excised, the ligature should be placed above the entrance of the common facial vein. I believe, however, that the value of this procedure is problematical, and that its use should be restricted to a comparatively small number of cases. I have yet to be convinced that cases recovering after simple ligation would not have recovered with the simple clearing out of the clot in the lateral sinus, without any interference with the jugular at all, and I think that you gentlemen who are just beginning the practice of medicine would be far safer in following the procedure which may seem at first extremely radical, but which will, I believe, in the long run prove to be the most conservative, so far as results are concerned.

There is a growing tendency among surgeons to deal with these cases more and more radically—that is, to excise the jugular in every case of sinus thrombosis, rather than to resort to the simple operation of evacuating the clot from the sinus, and then waiting to see if this simple procedure will be efficient.

The plan to be adopted must depend upon the severity of the symptoms in each individual case. But it is better to err on the side of radicalism and save the patient than to be too conservative, and thereby sacrifice a life.

THE THREE-STEP OPERATION IN TUMORS OF THE SIGMOID AND COLON.

BY JAMES P. TUTTLE, A.M., M.D., NEW YORK, N. Y.,
Emeritus Professor of Rectal Diseases in the New York Polyclinic Medical School, New York.

In 1901, after discussing extirpation of high cancers in the rectum, I stated:

"The thought has suggested itself that in carcinoma of the sigmoid, in which the tumor can be brought entirely outside the abdominal wall, it might be safe to fix it in this position until the peritoneal cavity is closed off by adhesions, and then excise it extra-abdominally. This would involve an artificial anus, to close which finally it would be necessary to employ end-to-end union of the segments, and this might be quite as dangerous as performing the entire operation at one sitting. The case which suggested this thought was the fatal one in this series. The stricture in this instance was so tight that it was impossible to thoroughly empty the bowel before the operation; as a consequence of this there was a large mass of hard fecal balls in the colon above the site of the tumor. The gut was dragged outside of the abdominal wound after it was cut across above the tumor, and as many of these as possible were removed, but unfortunately one of those high up in the transverse colon came down and obstructed the aperture in the Murphy button, thus causing obstruction and tearing of the gut, which was followed by peritonitis and death. In such cases, therefore, where the upper bowel cannot be emptied before the operation, the author would advise either making a temporary colotomy until the bowel could be cleaned out, and then remove the neoplasm at another sitting, or the employment of the extra-

abdominal method suggested above." (Diseases of the Anus, Rectum, and Pelvic Colon.)

After eleven years' observation and experience in four cases I would now go further and say that I believe that almost

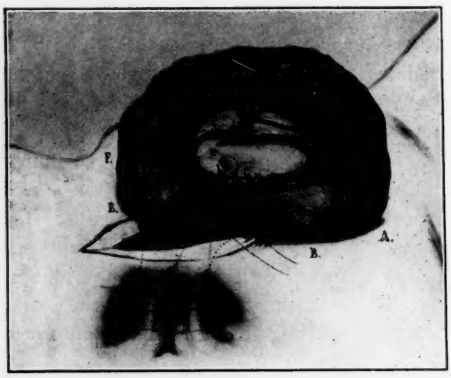


FIG. 1.—Sigmoid with tumor drawn out on abdominal wall, showing the peritoneal layers of the mesosigmoid cut, thrown back, and sutured over so as to leave no raw surface in the abdominal cavity. The two legs of the sigmoid are drawn out through the abdominal wall and brought together by two lines of sutures, so as to bring into apposition the sides of the gut and prevent wounding the artery in the mesentery when the clamp is put on.

all cases of neoplasm or tight stricture of the sigmoid, or even diverticula, ought to be removed by extra-peritoneal excision. At that time I had not formulated my technique, nor was I prepared to speak as positively as I am now. The mortality from resection of the sigmoid, whether by end-to-end or lateral anastomosis, is so high that almost any step to reduce it ought to be welcomed by surgeons and patients alike.

In the four cases that I have operated upon by this method all are alive—three for cancer and one for stricture. The one for stricture was syphilitic and died from this disease some nine months after the operation. Two of the cancer cases now live in New York, and one has gone back to Italy apparently well at the time of leaving me, four years after the operation. This compares most favorably, though a small number of cases, with my own experience and my research in literature, which gives over 50 per cent mortality for resection of the sigmoid and direct union. I therefore offer the following technique, not as a perfect method, because I believe some ingenious surgeon will come along and improve upon it in due time, but as a method which may be relied upon and may be the means of suggesting a better one.

Assuming that the growth is above the rectosigmoidal juncture and movable, the incision is made through the outer margin of the left rectus muscle; we make this incision because if it proves impossible to remove the growth it is one of the best incisions for the exit of an artificial anus. Care should be taken not to wound any of the large veins that run along this region. The abdomen having been opened by an incision three or four inches long in order to give plenty of working space, the patient is placed in Trendelenburg's posture, and the small intestines all lifted out of the pelvis and packed up as high in the abdomen as possible. The sigmoid is then caught and pulled out of the abdomen; the peritoneal covering of the mesosigmoid is then slit along for a distance well above and below the tumor (Fig. 1); this incision

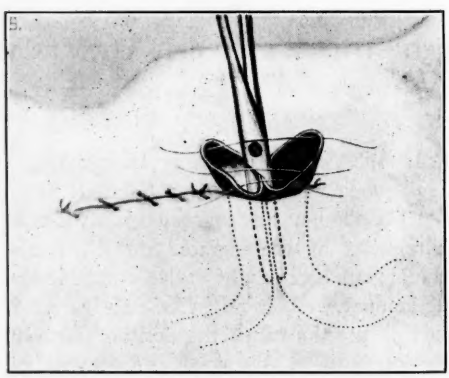


FIG. 2.—The tumor having been removed, the clamp is adjusted to cut away the spur, and the sutures by which the artificial anus is to be brought together are shown introduced; these are put in when the artificial anus is closed.

should be made on each side and rather close to the gut itself. The peritoneum is then peeled back to the posterior abdominal wall, or rather to the crest of the ilium.

The blood-vessels and their containing cellular tissues and glands are exposed, and

the loosening of the peritoneal glands will allow the gut to be brought out upon the abdominal wall. All glands and fatty material around the blood-vessel supplying the part of the gut which is involved in the growth are pulled or milked away toward the gut, thus exposing the blood-vessels. The artery and veins can then be clearly seen, and the main vessel supplying the involved portion is cut and tied in two places, as will be seen in Fig. 1. The gut is thus loosened and can be pulled out of the abdominal cavity. The stumps of the blood-vessels are pushed back between the two peritoneal layers of the mesosigmoid, these two layers are stretched together, thus covering up all the nude surface in the peritoneal cavity. The two legs of the loop of the sigmoid are now brought together by one row of sutures running along the border of the mesentery, well down to the peritoneal cavity; they are then rotated on themselves, and another row of sutures is run from the same level along through the long muscular bands of either leg down to the peritoneum as before, thus bringing the flat surfaces of the gut together.

The peritoneum is now stretched around the two legs, with the tumor brought well

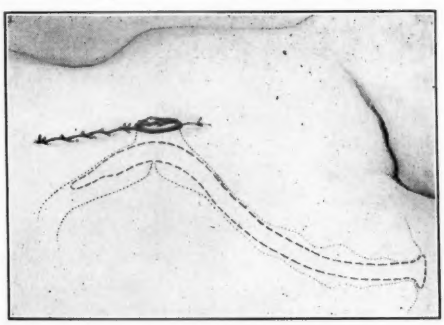


FIG. 3.—Showing a long rubber bougie introduced so as to press back the lower wall of the united gut where the clamp has cut away the spur.

outside the abdominal cavity, and after this the gut is stretched to the skin; it is then covered with rubber tissue and left *in situ* from twenty-four to seventy-two hours, according to the condition of the patient. If there is any indication of obstruction a puncture can be made in the upper loop for allowing gas to escape, or if gangrene should be imminent in the loop exposed there is no reason why it should not be excised any time after eighteen hours or less. In my second last case I excised the growth in twenty hours after the operation, without any complications. When the gut

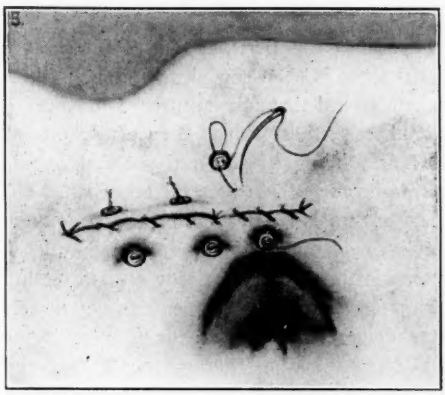


FIG. 4.—Shows the gut dropped back between the peritoneal and abdominal muscles, the latter being held in apposition by buttons and silver wire. The skin is brought together by simple running sutures, either overhand or subcutaneous.

is excised it should be done by a V-shaped incision, as in Fig. 2, in order that there may be abundant material for bringing the ends together at a later period.

It will be observed that having tied off the main blood-vessel supplying this loop there will be little or no hemorrhage and no pain in this resection; and there is no danger of peritoneal infection, as this cavity will have been closed off after the first five or six hours. Four or five days, or almost a week, should elapse before the clamps are put in to cut away the spurs. I use a Pryor hysterectomy clamp, and introduce it well down into the two legs of the artificial anus; it takes from three to seven days for this to cut through before the forceps come away; I then introduce through the rectum a No. 8 Wyeth modified Wales bougie, passing it up beyond the artificial anus. Its tip will usually come out of the artificial anus, but it can be reintroduced and carried into the upper leg of the spur—its elacticity will press the spur backward and cause the mouth of the

artificial anus to roll inward. This bougie is left in for two hours, three times a day, until the wound caused by its cutting away the spur has healed, thus giving a wide aperture for the passing of fecal material downward.

The next step consists of dissecting the edges of the artificial anus away from the skin and the fascia of the abdominal wall down into the peritoneum. The aperture in the gut is then sewed up by one row of through-and-through sutures and one of Lembert's; these must be carefully placed, the first being of silk and the last of fine chromic gut. This being accomplished the peritoneum is stripped from the abdominal wall for about a half-inch all around the wound; the cicatricial tissue and fascia are trimmed away, and three or four double anchoring sutures threaded upon agate buttons are passed across the wound and out upon the skin on either side to about one inch away from the margin of the wound. The buttons serve as bases for the sutures to rest upon and prevent their cutting into the skin, and render them much less painful than the ordinary suture. If the wound should gape one can twist the button like a tourniquet and bring the parts closer together. After the sutures have been tightened an ordinary subcutaneous suture is used to bring the skin together.

It is not presumed that every one of these cases will heal perfectly without a small fecal fistula, but in time they will all close up. The operation is not so brilliant as that of end-to-end or lateral anastomosis when these succeed by primary union, but it is much safer; in fact, barring some unforeseen accident, I see no reason why we should ever lose a resection by this technique. It is slower, to be sure, and the patients chafe under the artificial anus during the first steps, but when they learn the conservatism of the method and the great risk avoided, they are well satisfied.

OINTMENT SCARLET RED IN THE TREATMENT OF EYE DISEASES.

BY WILLIS O. NANCE, M.D.,
Attending Surgeon, Illinois Charitable Eye and Ear Infirmary, Chicago, Ill.

In the *Journal of Ophthalmology and Oto-Laryngology* for February, 1911, the writer called attention to the excellent results which he had obtained from the use of scarlet red ointment in certain corneal diseases, notably in those deeper affections of the cornea which involved loss of tissue. During the twelve months intervening since that report was published he has employed the ointment almost daily in his dispensary and private practice, and his later experience has fully justified his belief as expressed in the article before mentioned, that "in scarlet red we have a safe therapeutic agent of value."

Scarlet red, or the *Scharlach Roth* of Biebrich, is simply an anilin dye derived from disulphonic acid. It was first brought to the attention of the chemical world in 1882. Davis, of Johns Hopkins, appears to be the first to employ the dye, at least to any extent, in a therapeutic way. In 1909 he published a series of cases of granulating wounds treated with scarlet red with marked benefit, and concluded that "the stability, thickness, and normal appearance of healing under this dye is noteworthy." Fischer, of Bonn, however, three years earlier declared his belief that the product exerted a marked influence as a specific attraxin upon surface epithelium. Since Davis's contribution the dye has been employed successfully by many surgeons, particularly in cases in which there was more or less extensive loss of epidermis, in burns, etc. Its favorable use in accelerating epidermization and cicatrization has been proved by the writer recently in several cases of burns of the skin and tissue in the vicinity of the eye. In one instance of rather severe scalding with loss of skin in the radius of from two to three inches

above and below the eye, the value of the ointment was positively and clearly demonstrated by its successful use on one part of the denuded surface, the other area being treated by the ordinarily employed surgical measures.

That scarlet red has a useful and valuable place in ocular therapy I am satisfied. Its especial effect in corneal disease is to incite and accelerate regeneration of stroma, thereby encouraging the process of cicatrization. It apparently has no antiseptic properties. Cases of ulcer of the cornea treated with scarlet red assuredly heal quicker than those in which it is not used.

The ointment employed in my work the past year has been that of Parke, Davis & Company. I have yet to meet with an instance in which the slightest irritation of the eye followed its use. The indications for its use in eye work are in ulcers of the cornea, perforating corneal wounds, loss of corneal tissue from pterygium operations, conjunctival injuries, loss of integument of the lids or other instances in which there is a loss of tissue.

A small bit of the ointment, the size of a pea or larger, is introduced two times a day into the conjunctival cul-de-sac in corneal diseases and a bandage applied. In loss of integument it may best be applied to the edges of the denuded surface. The use of the ointment in eye diseases does not of course supplant the use of antiseptics, mydriatics, etc., which should be employed as indicated.

The ointment has the advantage of being easily obtained and is inexpensive.

32 North State Street.

THE EFFECT OF TUBERCULIN (BOUILLON FILTRATE) ON THE PULSE IN PULMONARY TUBERCULOSIS.[1]

BY ROSWELL T. PETTIT,
Bacteriologist, Ottawa Tent Colony, Ottawa, Illinois.

Because of the complexity of the clinical picture presented by chronic pulmonary tuberculosis, the long period of time over which the infection usually extends, and because of the sudden turns the disease may take spontaneously for better or for worse, the determination of the value of any particular therapy in this disease is extremely difficult. For this reason the value of tuberculin in the treatment of pulmonary tuberculosis is still a much disputed question, but within the past few years it has been growing in favor and many reports concerning its use have been made. In fact, we are coming out of the period of reaction resulting from the disastrous results of overenthusiasm and misuse at the time of its introduction, and it is now well established that tuberculin, if used in small doses in well-controlled cases, in an institution, is not dangerous. The conclusions drawn from the mass of information at hand are that tuberculin is a valuable adjunct in the treatment of tuberculous infections.

How is the value of tuberculin to be determined? The course of the disease is so irregular and the immediate action of tuberculin, if used in small doses, is so slight that no definite convincing evidence is furnished by the clinical course of the disease, and hence case reports have been of little value in determining either the worth or uselessness of the tuberculin treatment.

Animal inoculation experiments have not given us much information. Some observers have noted an increase in resistance to tuberculous infection in susceptible animals following injections of tuberculin. Other investigators have found no change or an increased susceptibility in the inoculated animals.

A number of investigators have also noted an increase in the antibody content

[1]Work done under the Max Pam Research Fund.

of the blood following tuberculin injections, but the immunity reactions have never been sharp and many workers have failed to demonstrate them entirely.

In a large number of cases the results of treatment by the hygienic-dietetic method alone have been compared with the results in a large number of cases treated with tuberculin in addition to the hygienic-dietetic method. Most reports of this sort are based upon results at the time of discharge of the patient from the institution. Such statistical studies are worthless. We are not interested in the condition of the patient at the time of his discharge, but what we really want to know is whether he is alive, and if alive, what condition he is in two, three, or five years after leaving the institution.

I have collected statistics from the literature on about 2800 cases treated with tuberculin discharged from the institution from one to seven years, and on about 19,200 cases treated by the hygienic-dietetic method alone discharged from the institution from several months to eight years, with an average length of time since discharge of about three and one-half years. On comparing the results in these two groups of cases it was found that the percentage of success in the tuberculin-treated group was 68 and in the group of cases not receiving tuberculin it was 50 per cent, an advantage of 18 per cent in the tuberculin-treated group.

There are many objections to this sort of statistical study: (1) The tuberculin-treated cases may be selected and the control cases not. (2) It is extremely difficult to keep track of cases for two or five years after they leave an institution. (3) There is great looseness in the classification of cases and results, and hence the enthusiasm of the author is an important factor in determining the results of treatment. (Some authors report 90 per cent of cures!)

The results in 146 cases at the Ottawa Tent Colony treated with tuberculin in addition to the hygienic-dietetic method were 16 per cent better than those achieved in 234 cases treated by the hygienic-dietetic method alone. These cases had all been discharged at least eighteen months, with an average of about three years. The cases were not particularly selected, and the personal factor was eliminated as nearly as possible by having the tabulations made by an assistant not familiar with the cases. These results convince me that tuberculin is a valuable adjunct to our other methods of treatment.

The various criteria of improvement as well as ultimate results have been made the basis of comparison in studying the results in cases treated with tuberculin and cases treated without it. These various criteria are (1) effect on expectoration, (2) prevention of relapse, (3) regulation of fever, and (4) disappearance of tubercle bacilli from the sputum.

The effect of tuberculin on expectoration is a point that has received a great deal of comment, but on which very little quantitative work has been done. The immediate effect of tuberculin in doses that cause slight reaction is an increase in the expectoration, usually followed by a decrease or return to the usual amount after forty-eight to seventy-two hours. Whether the repeated injections of the various kinds of tuberculin cause a more rapid disappearance of the sputum is hard to determine. Many writers state that they do, but the author in a comparison of the expectoration in ten expectorating cases not receiving tuberculin and in ten cases receiving tuberculin, weighing the sputum every day for thirty days, could see no constant differences in the two groups that could be attributed to the tuberculin administration.

Concerning relapse, Lyman[1] treated 67 cases with tuberculin and 379 without it. After eight months 19 per cent of the treated cases and 27 per cent of the untreated cases were dead. In 170 cases at the Ottawa Tent Colony treated with tuberculin, 44, or 25.8 per cent, were dead in from two to six years. In 339 cases not treated with tuberculin, 171, or 50.4 per cent, were dead in from two to six years.

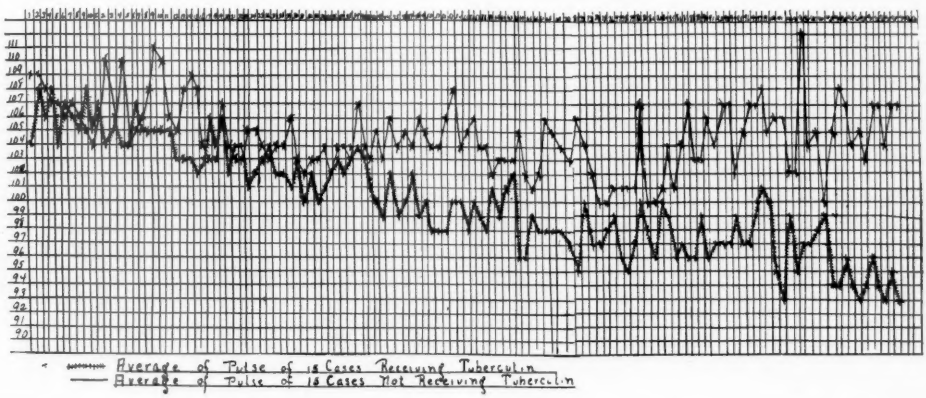
Numerous observations on the tempera-

[1]Lyman (D. R.): *Yale Med. Jour.*, October, 1910.

ture curve in tuberculin-treated cases have been made, but these observations are lacking in controls and hence are of little value.

The disappearance of the tubercle bacillus from the sputum has been made the basis of comparison of results in tuberculin- and non-tuberculin-treated cases by a number of authors. These studies constitute the most convincing evidence presented in favor of tuberculin. Tuberculin is a specific remedy for the tubercle bacillus, and its action is directed against this causative agent alone. There is a preponderance of evidence showing that secondary infection with the various pyogenic organisms—particularly the streptococci, staphylococci, and pneumococci—plays an important rôle in the production of the symptom-complex of chronic pulmonary tuberculosis, and even though clinical variations between specifically treated and non-specificially treated cases are not clearly demonstrable, bacteriological examination of the sputum shows that tuberculin has a definite effect upon the tubercle bacillus. There is a marked uniformity in the results reported by Lawrason Brown, Kreuser, Phillipi, Turban, and others.

The effect of tuberculin on the pulse is a point that has not attracted a great deal of attention, but in a number of cases with low-grade fever—99° to 99.8°—with persistently high and irregular pulse (above 100), I have noticed what I believed to be a comparatively rapid return to the normal following the administration of bouillon filtrate. A study of the pulse in these cases was made and compared with the pulse in cases not receiving tuberculin. The study of the pulse chart in individual cases yields but little; marked positive, doubtful, and negative results are found in cases receiving and cases not receiving tuberculin. Therefore, in order to obtain as nearly a just comparison of results as possible, the average pulse range of a number of cases should be used in making the comparison. In fifteen cases receiving bouillon filtrate the afternoon pulse from ten days before the first injection to 120 days after was taken, and the daily average of the fifteen cases during the period when tuberculin was administered. Fifteen cases of the same classification, moderately advanced and advanced, with afternoon pulse running above 100, but with an afternoon temperature below 99.8° constantly, were selected, and the average pulse range in this group was obtained in the same manner and for the same length of time. All recorded cases were subjected to the same conditions of housing, diet, exercise, season, climate, etc. The average daily pulse of these two groups was plotted graphically (see accompanying chart). A comparison of these curves shows very plainly that the effect of the tuberculin on the pulse is decisive.



CONCLUSION.

These findings, I believe, will warrant the conclusion that in cases with a low-grade temperature but persistently high

pulse—100 to 125—tuberculin (bouillon filtrate) is of value in restoring the pulse-temperature balance.

The explanation of this action may be that a toxin neutralization follows the injection of the soluble antigen.

THE PHARMACOLOGICAL ACTION OF VANADIUM.

In the *Journal of Pharmacology and Experimental Therapeutics* for May, 1912, JACKSON reaches these conclusions:

1. When administered intravenously the chief action of vanadium is expended on the vascular system. The central nervous system has but little influence on this action, for the rise in blood-pressure produced by injection of vanadium into an animal whose head has been removed from the body is almost identical, both in character and extent, with the rise produced by injection of the metal into a normal (etherized) animal.

2. With ordinary doses the mammalian heart is but little affected. The vagus endings in the heart remain active throughout the whole course of the intoxication in the intact animal. Batrachian and chelonian hearts seem to be more directly affected by the element than is the mammalian heart.

3. An intense peripheral vasoconstriction is produced by the metal in the spleen, kidneys, and intestines. In the intact animal the cutaneous and muscular vessels dilate from the visceral displacement of the blood, but in perfusion experiments the limb volume also decreases slightly under the action of vanadium.

4. The view held previously that the rise in general blood-pressure was due to a strong stimulation of the medullary vasoconstrictor center is wholly wrong.

5. The peripheral construction is due to a localized action within the organs themselves. It occurs in a perfectly normal manner in the excised and perfused organs of animals, whose general blood-pressure has previously fallen to zero under large doses of the metal.

6. With repeated intravenous injections of the same sized doses into an intact animal the rise in blood-pressure following each injection regularly decreases until at length a fall will be produced by each injection. This is due first to weakening and paralysis of the vasoconstrictor center, and second to a direct depression of the heart.

7. With a moderate dose the maximum rise in blood-pressure will be produced and a further increase in the size of the dose will not give any greater rise in the pressure. This seems due to the fact that a moderate dose gives the maximum contraction of the visceral vessels, and a larger dose does not produce any corresponding constriction of the remaining vessels of the body.

8. The peripheral action of vanadium on the visceral vessels is very much greater than that of barium.

9. With doses of epinephrine and of vanadium so adjusted that each will give the same rise in general blood-pressure, the vasoconstriction in the kidney, spleen, and intestine produced by vanadium will be very much greater in extent and duration than that produced by the epinephrine. On this basis the vanadium may possibly prove of use in internal hemorrhages occurring in these organs.

10. With moderate (intravenous) injections the general blood-pressure usually returns approximately to its normal level (or even below) several minutes before the constriction in the abdominal organs disappears.

11. There is an increase in the peristaltic movements of the intestines. But the local application of vanadium to a loop of intestine does not cause a local anemia or a contraction of the bowel wall as occurs with barium. These two elements also differ widely in their actions on the heart.

12. Smooth muscle, except the vessels and alimentary canal (and perhaps certain non-striated muscular elements in the spleen and kidney), does not seem to be affected by the metal. In toxic doses the substance acts upon the kidneys and gastrointestinal canal in a manner similar to that of other irritating metallic bodies.

EDITORIAL.

THE COMPARATIVE VALUE OF VARIOUS PREPARATIONS OF DIGITALIS.

There is perhaps no subject in connection with drug therapy which has been and is being more constantly and thoroughly studied than the action of various preparations of digitalis. We have always believed and taught that those who wish to obtain the full therapeutic value of this drug must employ one of the liquid preparations, since none of the so-called isolated principles of digitalis are capable of producing the good effects which the combined principles in tincture or infusion are known to possess. A useful summary of our knowledge in regard to this matter is contributed to the *Quarterly Journal of Medicine* for January, 1912, by W. E. Dixon. After pointing out the useful work which has been done by Fränkel in Germany, by Houghton in America, and by Haynes in England, he adds that the state of our chemical knowledge of digitalis is in a condition of complete confusion, and the same statement might with truth be applied to our knowledge of the various preparations of this drug which are placed upon the market chiefly by German manufacturers. Some of this confusion has arisen by reason of the fact that trade names have been given to isolated glucosides in such a way as to lead the physician to believe that the substance used represented one active principle of the drug, when in reality it was a combination of two or more active principles, and sometimes different names have been given to the same isolated products which have been identical in character although their mode of preparation may have differed. Thus, digitalin was isolated by Homolle and Quevenne as an amorphous product, and its great variations in physiological activity prove almost certainly that it is a mixture of active ingredients. On the other hand, Nativelle has prepared a crystalline body which he called "digitaline," and Schmiedeberg has isolated a product called "digitoxin," which seems to be a purified Nativelle's digitaline. So, too, Schmiedeberg isolated a saponine in an amorphous state which he called "digitonin," and Houdas has crystallized this substance and called it "digitalēine," although the word "digitalēine" had already been used by Schmiedeberg to describe an entirely different substance.

There can be no doubt that digitalin is one of the most, if not the most, active constituent of digitalis leaves, but as a matter of fact, when it is pure it is insoluble in water, although the addition to it of a little digitonin, which is nearly always present in digitalin tablets that are prepared for hypodermic use, renders it soluble. In other words, pure digitalin is not a commercial product, and he who uses digitalin is really employing a mixture of digitalin and digitonin. While it is generally said to be non-cumulative, we believe that there is no good evidence that this is true. Injected under the skin it often causes pain and inflammation.

Much difference of opinion has existed as to the proper dose of commercial digitalin. Some have given it in so small an amount as 1/100 of a grain, but Dixon believes that ¼- or ½-grain doses three or four times a day is the proper amount.

It is upon digitoxin that the irritant effects of digitalis upon the gastrointestinal tract probably depends. Because of its insolubility it is difficult to deal with and its irritant properties also prohibit its subcutaneous use. Its influence in contracting blood-vessels is much more powerful than that of digitalin, and, as it powerfully contracts the coronary vessels, it is in many instances contraindicated. Notwithstanding this fact, however, the French therapeutist, Huchard, has recommended the general employment of what he calls "digitoxin," which is really crystalline digitalin, and claims that it acts more rapidly than either of the other preparations which are supposed to be active principles.

Concerning the influence of digitalis upon the gastrointestinal tract, we confess that we rarely meet in our experience with

disorders of the stomach when this drug is used. Indeed, we think that strophanthus is much more prone to cause gastrointestinal disturbance than is digitalis. It is true that the infusion of digitalis, if freely used, may cause gastric distress, but we do not think that the tincture of digitalis is usually guilty of such a result. As a matter of fact Dixon seems to believe that the so-called glucosidal preparations are just as qualified to produce gastric disturbance as the galenical preparations.

Concerning digalen, or soluble digitoxin, it must be remembered that this is not the same substance as the crystalline product of Schmiedeberg and Killiani. It appears in the market as an aqueous solution, containing twenty-five per cent of glycerin, and 15 minims of this solution corresponds to .05 gramme of digitalis leaves, so that the average dose is about 15 minims of this preparation, corresponding to about .03 gramme of digalen. Killiani believes that digalen is mainly digitalëine.

We have gone far enough to show the hopeless confusion which exists in the minds of chemists, pharmacologists, and physicians concerning this matter, and this confusion is still another reason for adhering to the more old-fashioned liquid preparations in the majority of cases. It is interesting, however, to add that another preparation, "digipuratum," which is made by exhausting digitalis leaves with alcohol and ether, is said to possess about half the toxicity of ordinary digitalis leaves, and to be devoid of irritant effects on the stomach. A large amount of information concerning this substitute is not at hand. Indeed, the results reported by Booz in the Massachusetts General Hospital seem to be the best to be had, but it is claimed by others that it possesses cumulative effects, and this is to be expected in view of the fact that it is claimed to contain all the active glucosides of digitalis in an unmodified form, differing only from the ordinary galenical preparations by reason of the fact that most of the inert material and saponins are removed in its preparation.

Dixon's opinion concerning digitalone, which, it will be remembered, is not a preparation of a single active principle of digitalis, but a combination of all its active principles in an effective form, is that it has a typical digitalis action on the heart, but he seems to differ from those who have used it most in believing that it is not suitable for hypodermic use. In this we feel quite confident that he is mistaken. We have used it, and seen it used hypodermically liberally in a very great number of cases, with practically no trouble whatever from local irritation, and usually with very prompt results. In at least one of the large hospitals of Philadelphia it is constantly employed by members of the staff as an efficient cardiac stimulant when employed in this manner or by the mouth. Dixon also points out that Mandell in Germany has spoken highly of its value for intravenous injection. This observer employed it in seventy patients suffering from various kinds of cardiac disease and recommends a dose of 2 Cc. We have not had any experience with this method, but this amount —that is, about thirty minims—is the quantity which we have commonly used hypodermically. When digitalone has failed to act we believe that the dose has been too small.

We are interested to note that Dixon's concluding words express our own opinion, namely, that the substitution of active principles for galenical preparations of digitalis does not seem to be justified. Of course, digitalone is practically a galenical preparation in that it represents the active principles as does the tincture, for example. The great advantage of the active principles and of digitalone over the galenical preparations is that they can be given intravenously and hypodermically.

THE ELIMINATION OF DRUGS BY THE MAMMARY GLAND.

That the milk of nursing women is capable of carrying drugs which are taken by the mother into the body of the child has long been known. Attention to this matter is called by *Les Nouveaux Remèdes*

of February 24, 1912. This journal quotes Koldevijn concerning this subject, with particular reference to salicylic acid, the iodides, and mercury. It is also stated that Bucura has recorded the elimination of aspirin, iodine, calomel, arsenic, and bromine by this pathway.

Concerning the elimination of mercury a number of researches have been made both when the mercury has been given by inunction and when it has been given internally, as in the form of calomel. The results are very different in different cases, but experiments upon cows would seem to indicate that neither calomel when administered by the mouth nor mercury when used in mercurial ointment is eliminated in the milk. A number of investigations as to the elimination of lead in the milk have also been made upon cows, the conclusions reached being that the amount which passes out in the milk is exceedingly small, and only when the drug has been administered for a long time in large doses. Investigations by others upon cow's milk seemed to prove that antimony when taken internally does not escape in this manner, and the results obtained in a similar research with bismuth were also negative. Concerning alcohol, Reichert and others have shown that if alcohol is taken in excess some of it, failing to be oxidized in the body, is eliminated in the milk. Quinine may escape in the milk in very minute quantities. Urotropin when given in full dose is eliminated in its changed form in this secretion however, but an examination of milk after phenolphthalein had been taken for a number of days in the dose of from 7 to 15 grains gave negative results.

Practically all these researches have to do with the elimination of drugs in cow's milk, and therefore have only indirect bearing upon elimination in the milk of nursing women. A further research upon this subject is reported by Porcher in the same issue of *Les Nouveaux Remèdes*, the report having been made to a commission which was established to determine the relationship of milk to infantile mortality. Porcher believes that mercury is eliminated very irregularly in this secretion, but that lead, copper, zinc, antimony, bismuth, arsenic, and iron are fairly constant in their elimination. Chloral, when taken by a nursing mother, rarely influences the infant, but antipyrin may be eliminated in minute quantities and produce slight effects in the nursling. Vegetable alkaloids are also occasionally eliminated in very small quantities in the milk of women, but the research is a difficult one to carry out owing to the difficulty in establishing the presence of these substances after they have been altered in the body.

FOREIGN CURES.

Every physician of large practice and long experience is well aware of the fact that many of his well-to-do patients sooner or later decide that the only way in which they can get rid of certain troublesome symptoms or actual disease is to pay a visit to one of the French or German watering-places where they believe that some supernatural power resides in the waters which come from the springs or exists in the local atmosphere. Every physician of experience also knows that most of the good which comes from such a trip depends upon the fact that the patient starts out with the intention of doing nothing else except to regain his health; whereas while he stays at home the advice of his physician is not only taken with "a grain of salt," but is often not followed if the exigencies of business or the pursuit of pleasure makes the advice inconvenient or disagreeable. It is possible at some future time we may discover that the properties of certain waters do not depend so much upon the chemical substances which chemists have isolated as they do upon radioactive principles which are too small in amount to be readily recognized by analysis. Even if this should prove true, however, the psychic effect of a trip in search of health, if the patient is well enough to bear the journey, is often a most excellent remedy.

An interesting article dealing with this

matter is contributed to a recent issue of the *Medical Bulletin* by Dr. Stern, of New York, who "takes a peep," as he describes it, "behind the scenes of European Spas," and not only reveals much of the quackery practiced by these resorts, but with much satire reveals the weaknesses of human nature in patients and physicians. He does not mince his words, names the places to which he refers, and fails to give names only when he is dealing with individuals.

Dr. Stern evidently has not much confidence in the value of these European resorts, particularly in Germany and Austria. The places which he regards with little enthusiasm are so notable as Wiesbaden, Nauheim, and Homburg. He states that within his own recollection the medical powers have caused Nauheim "to shed its skin three times." Prior to 1890 its waters were exploited as a sure cure for locomotor ataxia. For the next two decades the waters were chiefly used for rheumatics, and since that time "the coffers of the Nauheimers have been filled with cardiopaths, real and imaginary." Stern even goes so far as to assert that some of the Nauheim physicians themselves let it be no secret that their treatment has no alleviating influence at all upon instances of organic heart disease, and he claims that it is chiefly Russians, Europeans, and Americans that fall victims to the claims of this resort. He also points out that it is a very common custom to split fees between the physician at the baths and the physician who sends the patient to the baths, and last of all ends what he has to say in regard to Nauheim by the statement that many go there never to return, and that day funerals are prohibited lest they cast a gloom upon the place, the bodies being shipped to the railroad station at night.

After touching up a number of other German resorts along the same lines he concludes with the statement that the fake sanatorium with its eccentric dietary and pseudo-religious atmosphere has no place whatsoever in the honest practice of medicine, and that the advertising methods resorted to by the foreign spas in an endeavor to prove that they are cure-alls prevent a natural development of American spas, like our own Saratoga.

While much that Dr. Stern says may be entirely correct concerning ethical matters at many European spas, it nevertheless is a fact that a certain proportion of patients are benefited by going to them. That they possess the wonderful therapeutic powers commonly thought is of course untrue, but to believe that they are entirely useless is equally unwise.

THE EFFECT OF PITUITRIN UPON THE UTERUS.

From time to time during the last eighteen months we have published in the Progress pages of the GAZETTE abstracts from current medical literature indicating that pituitrin is being more and more widely used because of the very specific influence which it exercises upon the uterine muscle. By far the largest amount of literature dealing with its effects on this part of the body has been in the German language, although Mummery in England and Williams have made contributions concerning it—the former in connection with its use in conditions of cardiovascular failure, and the latter with special reference to its circulatory effect in typhoid fever. Among those who have written concerning its uterine effect may be mentioned Foges and Höfstätter, and Schmid and Klotz, while Hofbauer, Stern, Gottfried, Schiffmann, and a number of others have made reports upon the uterine contractions which it induces in pregnant women. Nearly all of these reports have been favorable. Bab has reported records of its employment in the treatment of metrorrhagia and menorrhagia arising from different causes, and Scott and Ott have shown, by experiments upon animals, that the uterine muscle is directly affected by this drug.

In the issue of the *Journal Médical de Bruxelles* of April 18, 1912, is published a

communication made to the Royal Society of Medical and Natural Sciences in Brussels on the 15th day of April by Weymeersch, who reports upon the employment of this drug in pregnancy and in various gynecological conditions not associated with parturition. Using pituitrin hypodermically he evidently has become an advocate of its more general use. Thus, he reports the case of a woman who had borne three children, who had premature rupture of the membranes at eight and a half months with some dilatation of the cervix, but with no progress toward delivery. The first injection of 1 Cc. of pituitrin was followed by rhythmic uterine contractions lasting for two hours. The second injection did not seem to be markedly effective, but on the fourth day after the rupture of the membranes and after a quiet night the examination showed that the cervix was somewhat more dilated, and 1.5 Cc. of pituitrin was given hypodermically. After one-quarter of an hour, uterine contractions, which were regular and energetic, developed, and labor was terminated after a period of three hours, the infant living, the delivery being normal and no disagreeable after-effects being met with. This is practically a type of the other cases which he reports, which number seven, and which seemed to prove pretty conclusively that uterine activity can usually be induced in about fifteen or twenty minutes after a hypodermic injection of approximately 15 minims of the fluid preparation called pituitrin. In the case of an unmarried woman of forty years who was suffering from menorrhagia which was very profuse, pituitrin also proved advantageous. For three or four years the menstrual epochs had amounted to veritable hemorrhages, and often lasted from eight to ten days, sometimes requiring the use of a tampon. The patient became extremely anemic as a result of this. The use of styptics was tried without much advantage. Extract of mammary gland and adrenalin were also given without benefit, and the patient's condition became so desperate that a hysterectomy was advised. Before this was done, however, pituitrin was given subcutaneously. After the first injection of 1 Cc. the flow was materially modified. An injection was also given each succeeding day after three doses and repeated at the next menstrual epoch, whereby the menorrhagia was controlled, the flow became normal in amount, and lasted only four or five days. Two other cases of a somewhat similar nature are also reported.

Many years ago when adrenalin first appeared and a few observers reported disagreeable symptoms after its use, we pointed out in the editorial pages of the GAZETTE that no substance which is powerful enough to do good when properly used can be expected to be harmless if improperly used. This also holds true of pituitrin. It is manifest, from the articles which we have just quoted, and from other articles which have appeared, that the use of pituitrin for the purpose of producing uterine contractions before the os is dilated is not good therapeutics any more than it is wise to administer doses of ergot under such circumstances. On the other hand, where the patient suffers from general physical fatigue or uterine inertia after the os is dilated, it would seem that moderate doses of pituitrin can be given with care with very considerable advantage provided no obstruction exists which will prevent the ready expulsion of the child.

Finally, it is of interest to note that pituitrin has a very remarkable influence upon the secretion of the mammary glands. Scott and Ott have proved this upon the lower animals, and in a paper which was recently presented to the Obstetrical Society of Philadelphia a series of cases was reported in which women who were unable to nurse their children because of lack of milk secretion not only at a particular birth but with a history that this had been the case in previous pregnancies, secreted very considerable quantities of milk within a very short time after the hypodermic injection of pituitrin had been used.

It would seem to be evident that pituitrin when given hypodermically is not decom-

posed in the tissues, and while its effect is not as promptly exercised as when it is given intravenously, its hypodermic injection is nevertheless probably the best way to give it in the average case. Unlike adrenalin, too, it may be given by the stomach in certain cases with the gradual production of definite manifestations of its physiological influence.

THE SPECIFIC TREATMENT OF INFECTIONS, WITH ESPECIAL REFERENCE TO EPIDEMIC MENINGITIS.

Flexner's triumphant clinical vindication of his theories and researches concerning spinal meningitis implies a general acceptance of his methods, and it constitutes a convincing proof of the actual value of laboratory research and animal experimentation. Flexner (*Edinburgh Medical Journal*, May, 1912) briefly summarizing his work in meningitis notes that more than five years have now passed since the antimeningitis serum was first employed, the production of the serum dating from the pandemic of epidemic meningitis of 1904-1909, in New York City alone no less than 5000 victims having been recorded in the winter of 1904 to the spring of 1905. The average fatality, subject to marked fluctuations, has been about 75 per cent, nor was there any method of efficient treatment prior to the injection of the serum.

It was predictable that a serum potent in animals, in which infection could be controlled, might be prepared, since similar sera have been elaborated for many infectious bacteria. None of these have, however, established themselves as of therapeutic value in the treatment of the spontaneous bacterial infections in man, if it be understood that the bacterial intoxications are not being included in this statement. Though Flexner found that small animals—mice and guinea-pigs—could be protected against the meningococcus by means of an immunizing serum, this was accomplished under conditions very unlike those which obtain in epidemic meningitis in man. The spontaneous disease was more closely simulated by a meningitis in monkeys caused by direct subdural inoculation of virulent cultures of the meningococcus. Such inoculation was followed in a few hours by severe illness and by death in from one to three days. The meningococci in part disintegrated, in part multiplied, and distributed themselves, as in human cases, between the fluid exudate and the leucocytes or phagocytes. At the height of the infection a blood invasion occurred.

This monkey infection was prevented or cured by injections of the antimeningitis serum.

In order to remove all secondary factors large rhesus monkeys were immunized; with this homologous serum success was immediate, but the immune serum had to be injected directly into the inflamed membranes. Since the meninges are highly impermeable to extraneous substances and even to the normal protein and other constituents of the blood, it seems improbable that such complex and non-diffusible substances as bactericidal antibodies could pass this membranous barrier. It has been shown that the meningococcus is not easily subject to artificial cultivation, is extremely sensitive to osmotic conditions of the surrounding medium, and succumbs to a high serum concentration. The antiserum stimulated phagocytosis and caused a more rapid dissolution of the microörganisms thus included. It was noted that the dissolution of the diplococci in cultures outside the body takes place through a process of autolysis, and the recent autolytic products are themselves poisonous. In the rapid development of severe symptoms, after subdural inoculation of virulent cultures in monkeys, the toxic elements in the autolysate play a large part. Since these effects can be prevented or set aside by the serum injections, it follows that the serum possesses a certain power of neutralizing the toxic contents of the diplococci provided it can reach their source and situation.

When the serum is injected into the membranes by lumbar puncture within a given period of time after the inoculation

of the culture, in suitable amount and as often as the conditions require, the infected animals recover; when the serum is injected into the subcutaneous tissue or blood they succumb. The experiments verified the theoretical considerations. The direct injection of the serum arrests the inflammatory process and causes a rapid return of the turbid or purulent cerebrospinal liquid to a limpid state.

An immune serum prepared in the horse by alternate injections of a recent autolysate, prepared from the meningococci and dead and living cultures, developed properties similar to those present in the immune serum produced in monkeys, and it acted upon the experimental infection in monkeys in all essential respects much as did the homologous serum. The clinical test was made in the spring of 1907 and during the outbreak in Ohio covering a territory of several hundred miles. The mortality at the time of first employing the serum approached 90 per cent. The effect was immediate and almost magical. The mortality at once fell below 25 per cent, and among certain small groups of cases to 10 per cent. The doses of serum employed were smaller than are now recommended, and the repetitions were carried out with less system than now.

A second trial was made in 1908-1909. Thereafter the serum was distributed throughout the world. The number of cases studied and analyzed is 1300. The gross mortality was 30 per cent. Of 199 cases injected within the first three days of illness the mortality was 18 per cent; of 346 injected from the fourth to the seventh day of illness, the mortality was 27 per cent; and of 666 injected later than the seventh day of illness, the mortality was 36 per cent. Infants under one year old or between one and two years of age possess very little resistance to epidemic meningitis. The mortality among them has risen frequently to 100 and has fallen rarely below 90 per cent. Among the serum-treated patients of tender years the case records of 125 infants below one year of age were given in such detail as to enable Flexner to determine the effects of the serum according to the employment in the different time periods described. Of these 63 cases recovered and 62 died. There were five infants injected within the first three days of illness; all recovered. Of 16 injected within the first seven days 12 recovered. Of 104 cases which came under treatment at some period later than the seventh day, 46 recovered; the mortality in this group, while still far below that of the non-specifically treated, is nevertheless 56 per cent. The mortality rate from two to five years among 201 cases was 15 per cent. Older children appear more prone to recovery; of 201 such cases 171 recovered, thus bringing the mortality rate to 15 per cent. This figure separates naturally into the two rates of 10 per cent among the children who were injected early and 20 per cent among those injected later than the seventh day of illness. Among adults the death-rate was 39 per hundred.

It is obviously very important to contrast the fatality of the serum-treated cases with that of similar cases treated in other ways. In this way alone can a fair judgment be secured. Epidemics fluctuate—they tend to be severer at their height than when rising or falling, hence the comparison must be simultaneous. Fortunately we possess a number of such observations made in Great Britain and Ireland, France, America, and the Far East. They are fairly uniform. At none of these places did the average mortality fall below 70 per cent, and at none did that of the serum-treated cases exceed 25 per cent. The latest figures are particularly favorable. They come from France, Palestine, and Texas, and they fall below 15 per hundred.

The serum-treated cases ceased abruptly and often with striking celerity by crisis. The percentage of those temporarily or permanently invalided was distinctly lessened. It is rare for an accessible meningococcus to be capable of growth after the second or third serum injection, and not infrequently the first injection stops all multiplication, as far as can be judged from studies of the fluid withdrawn by

lumbar puncture. As the inflammatory exudate resolves and disintegrates the imprisoned diplococci are liberated and brought under the influence of the serum. In young children especially, in which the inflammatory exudate produces an obstruction at the base of the brain, dissociating the spinal membranes from the ventricles, the infection and inflammation may be overcome in the former while remaining active in the latter. The attempt has been made, and already with several successful instances, of withdrawing the infected fluid from the lateral ventricles and of replacing it with the serum. In infants with open fontanel the needle is readily inserted into the ventricle; in older children and adults a trephine opening is made in the skull. The operation itself is apparently safe. The employment in this way of the serum should not be too long deferred. The abolition of meningococcus having been accomplished the inflammation quickly subsides.

Not all strains of the meningococcus are so subject to the destructive action of the serum. Certain strains resist and multiply in spite of it. These serum-fast strains do not appear to be common. Deafness occurs early in many cases and before the treatment is instituted, but it has appeared after the treatment has been begun. Blindness, paralysis, and impaired mentality have either not occurred at all or so rarely as to be negligible as factors. In estimating this aspect of the larger question account should be taken of the fact that about three times as many persons now recover from the disease as there did formerly. It may be further stated that the recovery tends to be complete. The infection of the joints that complicates a certain small number of cases is relatively of simple and benign character. When treated by withdrawal of the contents and serum injection it is quickly arrested.

Flexner notes that there are not a few infectious processes of essentially local nature to which curative principles, whether native to the blood, or chemicals, or immune sera introduced into it from without, gain access very imperfectly, for the reason that they pass with difficulty into the lymph, or because the infectious lesion is not accessible to the lymph. Should these lesions be treated by direct introduction of the serum by injection they might prove more subject to control. Lesions of such essentially local nature are represented by infections of the serous membranes, that receive normally a dilute and modified lymph secretion; by massive inflammations, as in lobar pneumonia and abscess-formation, syphilitic gummata, tuberculous foci, and others that suggest themselves.

The influenza meningitis in man is a highly fatal inflammation. It occurs especially among children and is attended by the influenza bacillus septicemia. The subdural injection of virulent cultures of influenza bacillus into monkeys produces a corresponding condition, which can be abated by local treatment with an anti-influenzal serum. Artifically produced, pneumococcus meningitis in monkeys is a highly fatal infection also. It cannot be controlled by antipneumococcus serum alone, while it is subject to the local injection of a mixture of antipneumococcus serum and a lytic chemical such as sodium oleate. Neither acts alone, but in combination they exert a destructive effect upon the multiplying pneumococci provided they are brought into immediate relationship with the seat of disease, as can be done by means of intradural injection.

In carrying out the method it is necessary to keep the soap apart from the serum protein, for which it possesses an affinity, and this is accomplished through the addition of a minute quantity of boric acid. This chemical does not prevent the soap from acting upon the pneumococci, for which it has a still higher affinity.

In both influenza and pneumococcus meningeal inflammation a blood invasion with the bacteria occurs. This can be suppressed by the local mode of treatment, through which, first, the eruption of the bacteria into the blood is stopped, and secondly, the bacteria already in the blood are brought under the influence of the specific antisera which pass readily from the meninges into the blood.

BRAIN TUMOR OPERATIONS—OPERATIVE RESULTS.

A particularly valuable contribution, from the standpoint of immediate mortality and remote results, from the pen of von Eiselsberg, since there is reported therein presumably all of a very large experience, is published in the *Journal de Chirurgie,* tome viii, No. 1, 1912. From this article useful deductions can be drawn concerning both the immediate mortality of the operation and the ultimate gain observed in those who recovered from the surgical procedure. This affords a marked contrast to tabulations incident to the collection of any cases reported in literature, since it is notorious that as a rule only the successful cases thus find their way into print. Von Eiselsberg bases his contribution upon one hundred operative cases. Of the cerebral tumors 24 were in the region of the central convolutions, five were frontal, five were in the angular gyrus. In 11 cases the operation failed to reveal the tumor. There were nine operative deaths, the majority from infection; shock, embolus, and pneumonia accounting for the others. Of 23 operative cures one-half perished shortly afterward. Eight of these had survived more than a year. One of these, exhibiting a circumscribed glioma the size of an apple, is now, seventeen months later, busy at his work. The others are more or less crippled. Of 11 cases of cerebellar tumor, seven died very shortly after operation. One case is living two years after, having exhibited a cyst, and is stated to be much better. Of tumors of the ponto-cerebellar angle there were 12 cases, with eight deaths from shock or infection. In one instance four years after operation the patient was at his work, and exhibits no trouble aside from some defect in vision and a little ataxia. One, two years after operation, is working with better vision, but a hernia cerebri. One fourteen months after operation is almost blind with cerebral hernia. Another a year after operation is said to have a very good result. There are 11 cases in which the tumor was not found. Eight died quickly, one after six months. One eight years after operation exhibits betterment of vision and good general health. Of 10 cases treated by decompression, two died, two were not bettered, and six were improved.

The mortality of 77 cases of brain tumor is 62.5 per cent. As to the end results, sufficient time has not yet elapsed to definitely determine. On the whole they are not particularly inspiring. Von Eiselsberg operates in two stages. At the end of the first stage a tampon is left in place, provided the hemostasis is not satisfactory, and the wound closed without drainage with an aluminum-bronze wire. The second operation is practiced from six to ten days after the first. For enucleation of the tumor the finger is the best instrument. When there is infiltration, incision is carried through the tissue for some distance from this. Tamponing he regards as inevitably leading to infection. If the dura mater cannot be closed he transfers into it a flap of fascia. Preparatory treatment includes as an important element the preliminary administration of urotropin for three or four days, this having been found to cause the appearance of formaldehyde in the cerebrospinal fluid. Ether is used as the anesthetic, with the patient in a half-sitting position. Scalp hemostasis is provided by means of an Esmarch tube.

In considering the high mortality and the somewhat discouraging ultimate results it is interesting to know that von Eiselsberg announces himself as unqualifiedly in favor of undertaking these operations, since otherwise the patient is inevitably condemned, unless a sudden death should mercifully release him, to blindness and appalling headaches. Even if the diagnosis is not absolutely established, given the presence of pressure symptoms, he believes in exploratory or decompression procedures. He regards the prognosis as worse in cerebral tuberculosis and diffuse gliomas. Epitheliomas of the dura mater are considered distinctly favorable, as are the acoustic tumors.

In relation to this communication that of

Anton and von Bremen is of interest from the standpoint of palliation. They call attention to the fact in their note that decompression does not always fulfil its promises and propose to substitute it by puncture of the corpus callosum, which they practice. A small trephine opening is made near the coronal suture; the dura mater is exposed and perforated with a large curved trocar where large veins are not visible. The trocar follows the falx and thus reaches the corpus callosum, where it forms the roof of the lateral ventricle. It is introduced into the latter, draining it. If needful the opening is enlarged and a sizable communication established between the ventricular cavity and the subarachnoid space. They thus operated upon 50 cases without an operative death, although one died shortly after. In 28 cases in which there was papilloedema great betterment followed in 19. In 26 cases coma disappeared. In 28 cases motor troubles were greatly bettered, and in 31 cases the cephalalgia was cured for a long period. Vomiting also showed similar amelioration. The results were least favorable in ventricular tumors, to which class belonged eight of their series. Five were tumors of the hypophysis, nine were external tumors, 17 were cases of hydrocephalus, two of epilepsy, two of the corpora quadrigemina.

REPORTS ON THERAPEUTIC PROGRESS.

PITUITRIN IN LABOR.

Alfred Studeny (*Wiener klinische Wochenschrift,* No. 51, 1911) reports on a large number of labor cases and cases of abortion treated by pituitrin at the midwifery hospital in Brünn. Pituitrin is a watery extract of the hypophysis which pharmacologically and in some of its physiological effects is similar to adrenalin. V. Frankl, Hochwart, and Fröhlich found that in rabbits, both during pregnancy and when giving suck, injections of pituitrin led to an increased excitability of the muscles of the bladder and hypogastric nerve, and to the production of strong and protracted contractions of the uterus. They therefore recommend the use of pituitrin in gynecological and urological practice. This recommendation has been fairly widely followed with good results. In the author's cases Parke, Davis & Co.'s preparation was used. The original dose of 0.6 Cc. was found to be too small, and as a rule 1 Cc. was given in the latter cases; larger doses were given in the third stage of labor without harmful result, but without any special advantage.

The effect of pituitrin in exciting labor pains was usually apparent in from three to five minutes, but was in one case postponed to eighteen minutes. As a rule, the pains set in moderately, increased gradually, and began to weaken after about an hour. In a few cases, but never in those in the first stage, tonic contraction of the uterus occurred, and persisted in one instance for as long as five minutes.

Pituitrin was used in 89 labor cases. In the first stage the effect in strengthening the pains was very marked, and was very noticeable in one case of a primipara thirty-seven years of age. In five of the cases the effect, though marked, was only temporary, and in spite of repetition of the dose it could not be stated with certainty that the labor had been shortened in duration. In the expulsive stage pituitrin gave excellent results in thirty-four instances, most of them protracted cases; in fifteen the birth followed during the first quarter of an hour after the injection, in thirteen during the next hour, in six during the next two hours. On the other hand, the extract failed in some cases of abnormal resistance on the side of the soft parts or bony pelvis, and failed also in eight cases of primary uterine inertia.

Pituitrin was further given in five cases of rigidity of the soft parts, six cases of disproportion between the head and the pelvis, three of craniotomy with contracted

pelvis, nine of placenta previa, six of induction of labor. In two cases the pains stopped after a short time, and in a third pituitrin had no effect. In the cases of induction of labor, pituitrin was used in combination with operative measures, and a definite opinion as to its value could not be formed. In one case, however, of a thirty-eight-year-old 4-para, who in previous labors had had few pains and had been delivered by forceps, and had suffered twice from severe postpartum atony, labor pains set in strongly after 3.6 Cc. of pituitrin had been given in the course of forty-eight hours, and forceps were only applied with very little force, while the puerperium was normal. In the whole series of cases in which labor ended spontaneously there were only two of postpartum hemorrhage, and none of atony. In the operative cases, however, there was a large proportion of cases of hemorrhage, nearly all of them cases in which pituitrin had failed to act. These facts suggest a tonic action of pituitrin on the uterine muscle continuing after labor. The results were not especially good either when pituitrin was given only after delivery, or in cases of early abortion. Pituitrin was not found in any case to be harmful to the child.

On the whole the author considers pituitrin to be the most reliable agency for strengthening labor pains which we possess, and also considers that given during labor it lessens the likelihood of postpartum atony. It is very unreliable when atony is developed. Pituitrin is non-poisonous. It is without effect in the production of uterine contraction during the early months of pregnancy.—*British Medical Journal*, March 9, 1912.

THE EFFECT OF CAFFEINE ON THE CIRCULATION.

SALANT in the *Journal of Pharmacology and Experimental Therapeutics* for March, 1912, states that the intravenous injection of 15 to 25 mgs. of caffeine per kilo in animals was followed by a fall of blood-pressure amounting to 7 to 35 per cent in most cases, which was, however, transitory in character. In some animals the blood-pressure remained unchanged after such doses. A moderate rise of blood-pressure was rarely observed. Experiments were also conducted to test the effect of various anesthetics on changes in blood-pressure caused by caffeine. Some experiments were also made under local anesthesia.

Small doses of caffeine aid the action of nitrites on the circulation. A secondary rise was observed in a small number of cases under these conditions.

The effect of acetanilide is markedly increased when caffeine is given at the same time or when injected soon after. Increased rate and irregularity of heart action was also observed when acetanilide was followed by caffeine. Similar results were observed when caffeine was injected intravenously after ethyl or amyl alcohol, but depression of the circulation was more marked after the latter. $BaCl_2$ injected intravenously after previous administration of caffeine was found to be toxic even in very small quantities, and the blood-pressure dropped suddenly; 0.5 to 1.0 mg. per kilo proved fatal, while much larger quantities of this salt administered to controls caused some disturbance of the circulation, but was not fatal.

THE TREATMENT OF ASIATIC CHOLERA, OR OF ACUTE HYPOEPINEPHRIA, WITH ADRENALIN.

NAAMÉ, of Tunis, in *Concours Médicale*, No. 13, 1912, publishes an interesting memoir, in which he says that the two great symptoms of cholera, whether infantile, Asiatic, or sporadic, viz., vomiting and especially diarrhea, to which may be added algidity, asthenia, cramp, etc., are indubitable signs of suprarenal insufficiency, or, in other words, of acute hypoepinephria.

According to his experience of cholera, injections of adrenalin, combined with Hayem's serum—or of glucose serum in cases of anuria—are of real service. The same applies to cases of non-Asiatic cholera. Suprarenal opotherapy constitutes

the best treatment of the choleraic syndromes, no matter whether they are due to the specific bacillus or to another species.

Adrenalin stimulates the functions of the suprarenal glands and the formation in the organism of opsonins or alexins, which are necessary to phagocytosis.

The adult hypodermic dose of adrenalin is in slight or average cases from 3 to 4 milligrammes in twenty-four hours for three to four days. It is even better in acute cases to inject on the first day 5 to 6 milligrammes, the cholera patient being able to tolerate large quantities of adrenalin.

In severe cases, accompanied by collapse, the author recommends the intravenous injection of 2 to 3 milligrammes of adrenalin diluted with a saline or glucose solution. The injection is to be repeated a second time within twenty-four hours. In addition to this he recommends that one should take as a prophylactic measure, in epidemics, 3 to 5 drops of the solution 1:1000 every morning.

According to the author his experiments with adrenalin medication are conclusive; if the disease is in its opening stages development is arrested. The algidity tends to disappear and the general condition improves. The period of reaction or complications is suppressed, convalescence starting. Within a week the patient can take soups, egg, etc.

The author insists on the point that absolute rest is an important factor, since even removal to the hospital is likely to aggravate the symptoms in a slight attack, and even to cause the death of a patient in a serious condition. Dr. Naamé has used this method with twenty patients, all of whom were cured. He insists on the use of adrenalin as against that of the extract of the whole gland, and concludes by saying that in certain infectious diseases, such as cholera, which represent a state of glandular insufficiency, opotherapy will advantageously replace serotherapy, when this has failed, acting as a phagocytic, microbicide, and antitoxic medication.

From the patients treated Dr. Naamé reports five persons of the same family who were seized with acute diarrhea, characterized by twelve to fifteen stools daily. After daily injections of 3 milligrammes to each patient for three days and liquid nourishment during forty-eight hours, recovery took place without the cholera having completed its evolution.

In another case, Dr. Naamé was called to a child of eight months who was suffering from sudden diarrhea and had had five to six stools. The mother having declined to allow the adrenalin treatment, the diarrhea increased, vomiting took place, and at two o'clock the child was pale and cold. Two hours after the injection of ½ milligramme of adrenalin in 25 grammes of Hayem's serum the child was warmer. The anuria ceased during the night, and a second injection of ½ milligramme of adrenalin on the following day concluded the treatment.

Finally the author mentions the case of a woman showing all the symptoms of the disease, vomiting, acute asthenia, diarrhea, cramp, algidity, anuria, etc. Daily injections of 3 milligrammes of adrenalin enabled the patient to leave her bed after five days and to walk about the room. She could take milk, vegetable soup, etc.

THE VALUE OF ALBUMIN MILK ("EIWEISS MILCH") IN THE NUTRITIONAL DISTURBANCES OF INFANCY.

HEMPELMANN gives an excellent summary of this subject in the *Interstate Medical Journal* for May, 1912.

"Eiweiss Milch" (variously called albumin, casein, or protein milk by American writers) consists, briefly, of the curd from a liter of whole milk, added to one-half liter of fat-free buttermilk, plus water to make one liter, and maltose added in various amounts, according to the individual case.

It is now approximately two years since Finkelstein and Meyer, the originators of albumin milk, first published their results with this form of food, and since that time it has been given a trial in dozens of clinics,

both in Europe and in this country. After this lapse of time, it seems probable that some accurate estimation of its value might be made, for the literature on the subject is voluminous. In looking over some of the more recent literature on this topic, one cannot fail to be impressed with the generally favorable attitude of most of the writers toward albumin milk, even though there are still some who are not fully convinced that it has any special value. Many of the writers substantiate the claims of Finkelstein and Meyer that it is the best substitute for mother's milk so far discovered, while practically all find it valuable in at least some one of the various forms of nutritional disturbance in infancy.

In order to obtain the best results with this food, it seems necessary to adhere very closely to the directions given by Finkelstein and Meyer, not only as to the preparation of the food, but also in regard to its dosage, and the proper addition of the carbohydrates. The main points to be remembered regarding its proper use are that the dosage should be rapidly increased up to 180 to 200 Cc. per kilogramme of the child's weight, and that the carbohydrates should also be rapidly increased from the 2 to 3 per cent ordinarily used at the beginning of treatment to 5 to 7 per cent, only reducing the carbohydrates below 2 per cent in the very severe cases. This increase in the food quantity and carbohydrate content may be made without waiting for the stools to become normal.

Failure to obtain good results with albumin milk Finkelstein and Meyer attribute ordinarily to one of the following errors in technique, namely: (1) using too small a quantity of albumin milk in the beginning or increasing the amount too slowly; (2) adding carbohydrates too late or in too small an amount; (3) reducing carbohydrates too much or too often on account of an apparent return of the original nutritional disturbance.

Abt, in speaking of his visit to Finkelstein's clinic, comments on the excellent results obtained here with this method of feeding, which he says is "successful in nearly every case." He also comments on the low mortality and the healthy appearance of the infants after a course of this treatment, although many of the cases would have been considered very unfavorable on admission.

Grosser reports 52 cases, with only five failures, and says the only ill effects he has noticed were occasional signs of the exudative diathesis, and, when the food was long continued, the infants became pale and anemic looking.

Rollet reports in detail his experiences with this food in the Berlin Charité Polyclinic, in cases which he regards as furnishing relatively unfavorable material, since in a clinic the cases cannot be closely watched and controlled. He used the food in 95 cases, only 56 of which can be considered, since the others either did not return or changed the food of their own accord. Of these 56 cases, 31 were "dyspepsias" mostly in children between three and six months of age, in whom the diarrheas ceased within the first few days. In 11 of these cases, as an experiment, there was no carbohydrate added during the time that the albumin milk was given, and two of these cases died suddenly, in collapse. Otherwise the results were uniformly good. The rest of the 56 cases were classed under "intoxication," "decomposition," and "Mehlnaehrschaden" (starch nutritional disturbance), in all of which the results were excellent. Two cases of "decomposition" died before sugar had been added to their diet, but these were extremely severe from the start and probably could not have been saved by any other means. All the cases of decomposition were very much under weight and had had numerous other foods tried without result; and yet these cases not only gained on albumin milk, but were later able to take the ordinary foods again. In summing up, Rollet says that in his opinion, in spite of occasional bad results, albumin milk is an exceptionally valuable food, and adds that a food which so constantly controls severe and obstinate diarrheas, even though it cannot always ward off death, is surely a valuable therapeutic aid.

Albumin milk was originally stated to be valuable only if used in infants over eight weeks of age, yet Benfey tried it in 83 infants under three weeks of age, and came to the following conclusions: (1) With albumin milk you get better results than with any other artificial food; (2) it should be given in the amount of 150 to 200 Cc. per kilo of weight; (3) the sugar should rarely be below 3 per cent, and it is usually better to start at 5 per cent and go up to 6 or 8 per cent; (4) maltose is better than cane or milk sugar.

Welde used albumin milk in 48 cases, and of these 25 were dyspepsias, with 23 recoveries and two unimproved; 20 were cases of decomposition, with 16 recoveries and four deaths; three were cases of intoxication, with two recoveries and one death. He concludes that this food is indispensable in pediatrics.

Grulee reports 25 cases of nutritional disorders (all chosen because of their severity, and his conviction that they would not get along on other foods) with 18 recoveries, three failures, and four deaths. Of the deaths only two were uncomplicated nutritional disorders, and of the failures no infant was on albumin milk longer than twelve days. Fifteen of the 25 were four months or under, and most were marantic.

In comparing the results obtained with breast milk and the new food, Doeblin gives the following statistics: Of 37 very severe cases fed on breast milk, 20 died (14 of these during the first week's treatment) and 17 got well—that is, about three-fifths died and about two-fifths recovered. Of 51 equally severe cases treated with albumin milk, 33 died (about 60 per cent), and of these 25 died within the first week of treatment, the cases being so severe that he believes nothing could have saved them. He thinks the foregoing statistics sufficiently indicate the value of albumin milk, and believes that in some cases it is superior to breast milk.

Brady reports 20 cases in which five marantic babies made brilliant recoveries, one died, and all the rest made excellent recoveries.

Beck used albumin milk in 175 cases, 110 of which were dyspepsias, eight intoxications, four enterocolitis, and 17 decompositions. Of these, 12 died, and he adds that he does not think anything could have saved them, because four were moribund when admitted, four had on admission a bronchopneumonia which was the cause of death, three were the severest kind of atrophy, and one was a bad case of intoxication. He believes this food to be the best of all artificial foods.

Heiman, before the New York Academy of Medicine, reported 42 cases, 20 of a very severe type, with nine deaths, four of these being practically moribund on admission (dying within three days). He concludes albumin milk represents a distinct advance in the therapeutics of these conditions. In discussing this report, Morse said that his experience had been limited, and he could not explain the action of this food, but he had seen it do good sometimes. Talbot, Kerley, Chapin, and Koplik also discussed this paper, Talbot reporting very favorably and Chapin saying he thought it had a restricted value in certain cases. Kerley believed it more easily assimilated than cow's milk by older children with acute intestinal disturbances, and Koplik said he was not especially impressed with the results from albumin milk.

CARE AND CONTROL OF THE ALCOHOLIC.

LAMBERT, in the *Boston Medical and Surgical Journal* of April 25, 1912, says that the treatment which was given to him by Towns, and which he has published, he frankly admits is the one which seems in his experience to more quickly and thoroughly unpoison the mind and system from alcohol than any other treatment he has yet encountered. It hardly seems necessary to go into the details here. Briefly stated, it consists in the hourly dosage of a mixture of belladonna, hyoscyamus, and xanthoxylum. This mixture is given every hour, day and night, for about fifty hours. There is also given about every twelve hours a

vigorous catharsis of C. C. pills and blue mass. At the end of the treatment, when it is evident that there are abundant bilious stools, castor oil is given to clean out thoroughly the intestinal tract, and the reconstruction treatment of tonics is begun.

During this treatment it is essential that each patient be treated as a separate individual. One cannot treat them in a mass as alcoholics. They are individuals differently poisoned, and each one with his separate idiosyncrasies. The older they are, and the more thoroughly poisoned by alcohol, the more one will have to stimulate them during the treatment, and the more slowly will one taper them off from their whisky. The younger and more vigorous they are, the more quickly can one cut them off from their alcohol. The greater the poisoning and the more long-continued it has been, the more carefully will one watch them and quiet them with hypnotics. If the stomach is in a state of alcoholic gastritis, one will have to let this subside before beginning active medication.

How this mixture of belladonna, hyoscyamus, and xanthoxylum acts, Lambert frankly says he does not know. If any one of the ingredients is left out, the reaction of the cessation of desire is not as clear-cut as when the three are mixed together. The amount necessary to give is judged by the physiologic action of the belladonna it contains. When the face becomes flushed, the throat dry, and the pupils of the eyes dilated, one must cut down the mixture or cease giving it altogether until these symptoms pass by. One must, however, push this mixture until these symptoms appear, or we will not obtain a clear-cut cessation of the desire for the narcotic.

Patients who are very sensitive to mercury are difficult patients to treat, because the liver seems to require that peculiar action given to it by mercurial purges to be properly stirred and properly to excrete substances that are stored up in it, and finally be so stimulated that it pours out its bile in abundance and shows that the desired effect has been reached. The liver is the great chemical factory of the body, and the metabolism that goes on there is, in the great mass, still an unknown factor to us, but the method which is here outlined, though it may seem to be empirical, does not produce the effect of a stimulation or rearrangement of the hepatic functions so that the metabolism of the individual comes back rapidly as near to normal as is possible for that individual. The patients realize and acknowledge that they do not desire their narcotic, and they do not feel the need of it. In some of them, a small percentage, there is an actual physical disgust at the smell or sight of whisky just after they are through with this treatment. Whether or not it is an autosuggestion of an impressionable type of patient, Lambert asserts he does not know. It probably is. It always has been a voluntary expression on the part of the patient. Lambert has never suggested to one that such would occur. True it is that after they are through with this treatment they are very much more sensitive to alcohol. Many who have been long accustomed to take without apparent effect a steady daily dosage of alcohol sufficient to intoxicate many others, have found after this treatment that a small amount of alcohol quickly affected them, and affected them beyond the physiologic action, so that they themselves realized that they were rapidly poisoned. As, for example, one man who reverted after Lambert had given him the treatment, while previously he could go on a protracted hard spree of several weeks without having had delirium tremens, after a spree of not more than usual severity developed delirium tremens after three days.

There is nothing in this treatment to prevent alcoholics from going back to their alcohol. It sobers them up absolutely, it puts them on their feet in a condition so that they do not mentally or physically crave their narcotic, but as before stated, there are no chaperone pills connected with the treatment by which they can be prevented from going back to their indulgence. The weakness of their will and personality, the weakness of their mentality, is not immediately fully reconstructed. The after-

treatment, according to Lambert, is as important as the medicinal, and in his experience there is no question that those who go through a course of physical exercise and physical training for several weeks or months are those who soonest return the nearest to normal. The physical necessity of food, the building up by increased daily addition of new food, the burning up of waste products by exercise, and the proper elimination through this same muscular exercise, all bring about a rapid and vigorous building up of body and mind. To treat them as invalids, to treat these people as nervously down and nervously to be mollycoddled, is, in Lambert's opinion, a mistake. They should be treated as physical and mental wrecks, to be built up physically and mentally by as vigorous a process as each individual will stand without injury.

Lambert states he has often been asked what figures he could show regarding the effect of this treatment. When he was giving it in Bellevue Hospital, he gave it to any one who came to him and desired the treatment. There was no endeavor to pick cases, there was no difference made because of the mental condition of the patient or of his previous habits, or because of his possible return to unfavorable environment. There were 131 patients treated. Eighteen months afterward he endeavored to look up the records of these men: 43 could not be found, two were dead, and one was insane. Of the 85 in whom they could judge accurately of the results, 67 had reverted and 18 had remained abstinent. That is, 78.8 per cent had reverted and 21.2 per cent had remained straight. This is the severest test, Lambert asserts, that he knows, and that one could succeed in the ordinary alcoholic wards of Bellevue Hospital in one-fifth of the cases is a far better result than one could expect from the usual methods of treatment. Among those who have been given this treatment in a private institution during the past two years, having voluntarily sought the treatment, the results have been much more encouraging. Among these cases the percentage is practically reversed. In 375 patients there have been 46, or 12.2 per cent, known relapses. It has not been possible to follow these patients as accurately as those in Bellevue, but even if we double the percentage of known relapses, the results are most encouraging.

ARTIFICIAL PNEUMOTHORAX AS A TREATMENT OF PULMONARY TUBERCULOSIS.

In the *Archives of Internal Medicine* of April 15, 1912, ROBINSON and FLOYD state that twenty-eight cases of phthisis have been subjected by them to artificial pneumothorax therapy within the past two and one-half years. With three exceptions all of the cases have been advanced ones which had previously failed to respond to methods of therapeutic hygiene.

The last eight cases have been treated by nitrogen injection too recently to draw conclusions as to the ultimate result of the treatment. It may be said, however, that with the exception of the three cases in which a pleural space could not be established, a distinct relief of symptoms has been the immediate result of the lung compression in practically all of the reported cases of their series. The tuberculous process has been brought to a standstill in at least six of the cases which have been under constant observation and continued treatment. In two instances there has been cessation of all activity in both lungs.

The promptness and willingness with which most of the patients responded to summons for repeated injections were conclusive evidence at least of the symptomatic relief attending the therapy. This might have been credited in part to psychic influences had there not been a corresponding improvement in the objective signs revealed by repeated examinations.

From experience with the earlier cases they have been led to the employment of more frequent injections. It cannot be denied that this factor is of paramount importance. The completeness of the compression is thus more nearly attained; furthermore, the partial mobilization of the

lung permitted by the absorption of the nitrogen is promptly prevented by its early renewal.

The fatalities recorded were due to the unarrested progress of the disease in certain of the more advanced cases. In no instance was death referable in any way to the pneumothorax therapy.

"Pleural eclampsia" (Forlanini), or a reflex inhibition of the heart through vagus irritation from the pleura, is a danger to be considered in this treatment as in other therapy requiring thoracentesis. They believe that it may always be prevented by anesthetizing the pleura.

Air-embolism may result from the direct introduction of gas into a pulmonary vein. They believe this should never occur if the technique they describe is faithfully observed.

The authors have experienced no accidents, and believing that they are always avoidable, they conclude that pneumothorax therapy is a safe procedure.

Pulmonary tuberculosis when essentially unilateral, and resistant to hygienic treatment, is in a certain number of cases arrested by the continuous employment of artificial pneumothorax therapy. Their treatment has been of insufficient duration to permit them to claim a permanent cure in any one case. They believe that such is possible, however, as proved by the recent reports of Brauer and Spengler.

They conclude, therefore, that artificial pneumothorax is entitled to definite recognition in the treatment of pulmonary tuberculosis.

THE EFFECT OF PRESSURE-LOWERING DRUGS AND MEASURES ON SYSTOLIC AND DIASTOLIC PRESSURE IN MAN.

LAWRENCE in the *Archives of Internal Medicine* of April 15, 1912, reports his studies on this subject and concludes as follows:

1. The reduction of systolic pressure in cases of hypertension by the use of nitrites, venesection, electricity, or hot air is accompanied by a fall in diastolic pressure amounting, as a rule, to approximately one-half the systolic fall.

2. Such a reduction produces a coefficient of pressure more nearly approaching the normal than does the coefficient under the conditions of hypertension.

3. Sodium nitrite reduces diastolic pressure more rapidly than the more complex compounds, thus causing a shorter initial diminution of pulse-pressure than is obtained with mannitol or erythrol. Its effect on the pulse is more marked than that of the other two drugs. The duration of its action is slightly less.

4. None of the nitrite group is efficient for maintaining a pressure at a permanently lowered level, as a tolerance is soon acquired and increasing the dose is apt to cause unpleasant symptoms.

5. Venesection has a more lasting effect in lowering the pressure than have any of the drugs considered in this paper. The diastolic pressure is depressed longer than the systolic, the pulse-pressure thus being increased.

6. The effect of hot-air baths, electric-light baths, and treatment with high-frequency currents is uncertain. A fall in pressure, if produced, is transient.

7. Vasotonin is not certain in its action and is not safe to use in cases showing marked hypertension, an increase of which might bring about untoward results.

ULTRAMEDICAL OR ULTRASURGICAL TREATMENT FOR ECLAMPSIA?

The *Medical Record* of April 20, 1912, reminds us that a very few decades ago puerperal eclampsia was regarded on all sides as an affection with a practically guaranteed high average mortality under any and every plan of treatment. The large number of theoretical view-points as to the nature of the disease seemed to justify the employment of the most diverse measures of treatment. The fact that seemingly moribund patients recovered under many plans of management has been responsible for their continuance even in the absence of sound theory and perhaps at times in oppo-

sition to all tenable theories. But whenever any plan was tested on a sufficiently large material, and year in and out, it became apparent that the disease varies much in severity with the particular locality and year, and it began to appear that any real advances in therapeutics must necessarily be extremely hard to appreciate. There can, however, be little doubt to-day that the mortality of eclampsia has slowly been brought down by strict adherence to two completely opposite plans of treatment, which may be termed the ultrasurgical and ultramedical. To whatever degree eclampsia may depend on a general pregnancy toxicosis it is recognized that its efficient cause is really labor itself, or better the uterine contractions which comprise the latter and which may precede or follow it to a certain extent. Both this fact and the possibility that the fetus and placenta may be the source of toxic material appear to demand the immediate evacuation of the uterus. This was accomplished at first by the simpler means of hastening labor and eventually by accouchement forcé in the widest application of the term, even including vaginal and abdominal hysterotomy and hysterectomy. There seems no good reason to doubt that much life, maternal and fetal, has been saved by these heroic measures. Surgery has not stopped here, for in certain cases where renal stasis seems to prevent the hope of recovery the kidney itself is attacked by the operation of decapsulation. Comparatively recently the mammary glands as a probable source of the toxemia have been excluded provisionally from the circulation by a subcutaneous operation.

At a recent meeting of the Berlin Gynecological Society (*Berliner klinische Wochenschrift,* March 18, 1912) the veteran Olshausen spoke very pessimistically about eclampsia. We know nothing, he said, of its nature and hence have no rational treatment. Rapid evacuation of the uterus, an empirical measure, has secured about one-third better results than were obtainable before its introduction. We have allowed a valuable resource of the past to fall into disuse—that is, bleeding up to 500 to 600 Cc. In discussion it was suggested that the benefit derived from cutting operations was due really to the coincident loss of blood.

The medical treatment has been tested only on a relatively small number of cases, but has been followed up for years in certain localities with enough betterment in mortality percentage to startle those who have never seen the reports. Stroganoff has now treated about 400 cases with his narcotic method, which aims solely at jugulating the convulsions by a graduated use of morphine and chloral so given as to secure the greatest possible economy in dosage. The patients are also strictly isolated from the outer world in every possible way. The mortality at his hands has been but a fraction over 6 per cent. In the United States some of the leading obstetricians are depending upon the use of veratrum viride, which by lowering the high blood-pressure which appears to underlie the convulsions serves also to suppress the latter. Low death percentages have been secured under this plan. The only criticism of these figures is found in the claim that in certain favored localities eclampsia is much less malignant than in others.

If puerperal eclampsia is really an example of anaphylaxis and not an ordinary toxemia the rational treatment should be somewhat modified. In an anaphylaxis the patient is not menaced by a large amount of toxic material which necessitates all sorts of meddlesome eliminative procedures. She has simply become sensitized during an earlier pregnancy or during the early stages of the present pregnancy to substances normally present in all gravidæ. Whether or not an anaphylactic shock proves fatal will depend in part on factors entirely beyond our ken. The naturally high mortality of the analogous affection in cows has been practically wiped out by insufflation of air into the milk ducts. The German farmer no longer troubles to send for the veterinary, but inserts a turkey quill into a milk duct and by means of his bicycle pump forces air into the latter. But in the cow, at least in the severe type of

eclampsia, convulsions do not occur, but instead a collapse or, as it is commonly termed, a paralysis. From all points of view the convulsions seem to be the real object of treatment in mankind. The uterine contractions beget the convulsions. If these be made to cease by rapidly evacuating the uterus the prognosis is good. The earlier in the history of the convulsions the uterus is emptied the better the results. On the other hand, it may be possible to control the convulsions without greatly interfering with labor. This may be effected by keeping down the blood-pressure (by veratrum or copious venesections) or by so benumbing the reflex activity with narcotics that convulsions no longer occur. There are other pernicious factors aside from blood-pressure and convulsions which are reached by neither the ultrasurgical nor the ultramedical plans of treatment. But it will doubtless be found that cases of this sort occur largely in those patients who have exhibited pregnancy toxicosis long before term. Some of these women, if not most of them, could have been saved by early interruption of pregnancy.

ACETONURIA IN CHILDHOOD AND ANESTHETICS.

In the *Proceedings of the Royal Society of Medicine* for March, 1912, FREW writes on this subject and answers the question, Can this acetonuria be prevented? Most decidedly, yes. Beesly has recommended the exhibition of sodium bicarbonate before and after the anesthetic for this purpose, but an alkali cannot in any way make up for the carbohydrate starvation: it can but neutralize the resulting acidosis; it does not prevent its continued formation; it serves but as a cloak—the hypodermic of morphine in acute pain. Dr. Guthrie, to whom we are under a deep debt for bringing the subject of postanesthetic poisoning into prominence, has advocated the administration of nutrient enemata up to within two hours of operation, and if this enema contains enough absorbable carbohydrate, the effect would be obtained. Frew indicates in his paper what he believes to be the correct method as follows:

The "carbohydrate starvation" must be done away with—not by giving starchy foods, which are bulky, and therefore not available when the latent period before they can be absorbed is long; nor yet by giving cane-sugar or milk-sugar, which are not bulky it is true, but they must be prepared for absorption, and hence their use occasions some delay. Not to those, then, do we look, but to dextrose, which is our ideal remedy—it is not bulky, it is ready for absorption without preliminary preparation; and even when the disorder of metabolism is already set up, it can cause a return to the normal within twelve hours.

Therefore let us see to it rather that there is "no carbohydrate starvation either within four hours of the operation or at any period afterwards," and thus have the child in as healthy a condition as possible both during the time of anesthesia and in the period following it.

A STUDY OF THE RENAL EPITHELIUM IN VARIOUS TYPES OF ACUTE EXPERIMENTAL NEPHRITIS.

MACNIDER in the *Journal of Medical Research* for April, 1912, concludes from the experimental data presented in his investigations:

1. Cantharidin, potassium dichromate, uranium nitrate, and sodium arsenate produce in the dog an acute nephritis in which both the vascular and the epithelial elements of the kidneys are involved.

2. The histological study shows that the vascular element of the kidney is first affected, and that the rapidity with which the epithelium is involved depends principally upon the nephrotoxic substances employed in producing the nephritis.

3. Uranium nitrate and potassium dichromate usually produce a tubular nephritis much earlier than either cantharidin or sodium arsenate.

4. In the early stages of the nephritis from these poisons, when there is anatomi-

cal evidence of vascular injury and either slight or no anatomical evidence of epithelial injury, the output of urine is increased.

5. Later in the nephritis, when histologically the vascular pathology may not be increased in severity, but when the epithelium has become involved, the output of urine is reduced or an anuria is established.

6. Those nephrotoxic substances which have the most marked affinity for the tubular epithelium are the substances which most rapidly cause either a reduced output of urine or an anuria, while those nephrotoxic substances, such as arsenic, which cause an early and a pronounced vascular injury, with late epithelial involvement, are the poisons which have the least tendency to produce an anuria.

7. In the experiments detailed in this study which have shown either a pronounced decrease in the output of urine or an anuria, there has constantly been associated epithelial changes, which would produce in different degrees an obstruction of the lumen of the tubules.

8. In those experiments in which the output of urine has not been decreased, and in those experiments in which the output of urine was increased beyond the normal, such epithelial changes either did not exist or they were histologically slight.

THE USES OF TUBERCULIN IN PULMONARY TUBERCULOSIS.

LATHAM, in the *Proceedings of the Royal Society of Medicine* for March, 1912, defines the class of case for tuberculin therapy.

Although he would by no means go as far as some authorities who hold that tuberculin should not be given whenever there is evidence of secondary infection, yet he believes he cannot emphasize too strongly the necessity for care in the selection of cases for this treatment. There can be no doubt that tuberculin is capable of doing a great deal of harm, not only when improper dosage is employed, but also in comparatively large groups of cases. At one time he was not infrequently asked to demonstrate the value of tuberculin in cases which were obviously hopeless. To expect tuberculin to produce a miracle is foolish, and any expectation of good from a course of tuberculin in a series of advanced febrile cases in which there is marked secondary infection is foredoomed to disappointment. His experience suggests that tuberculin will not only do no good but will cause harmful results in those cases in which there is more or less constant autoinoculation, for example, cases in which frequent attacks of prolonged coughing or other symptoms produce a series of autoinoculations which are beyond our control. If we give tuberculin in such a case we increase what may already be an excessive dose of the patient's own bacterial products, and so merely court disaster. We must not, however, generalize too freely, for every case has to be considered on its individual merits. In spite of this we may say that the ideal cases for tuberculin therapy are the cases of recent origin with little constitutional disturbance and chronic afebrile cases—that is, the cases in which walking exercise to the extent of a few miles produces no febrile reaction.

Another class of case in which tuberculin is of great value, in that it may enable the patient to "turn the corner," is the class in which there is no real progress in spite of more or less prolonged treatment on sanatorium lines, but in which the patient is just holding his own. These, of course, are the classes in which the majority of observers have obtained the best results. He thinks, however, that tuberculin has not been given sufficiently in febrile pulmonary tuberculosis, although its use in such cases is much more difficult and calls for mature experience and judgment. In those cases in which there is much irregularity with regard to the rises of temperature, and in which all our efforts fail to control this symptom, tuberculin does harm. It is, however, possible sometimes to control the cause of these irregular autoinoculations. For example, a harassing cough involving much movement and fatigue may some-

times be controlled by the use of sedatives, such as codeine, or the continuous inhalation of antiseptic remedies; active laryngeal tuberculosis may be controlled by vocal rest, or frequent vomiting may be relieved by appropriate remedies. Or, again, it is possible in a certain number of cases to control the autoinoculations by means of what is called by the unfortunate name of artificial pneumothorax or compression of the diseased lung by means of nitrogen. When we can control the amount of autoinoculation in this way, and also in cases of febrile disease in which the autoinoculations are more or less regular, his belief is that tuberculin may often greatly improve the chances of recovery, and he urges its wider use in such instances at the hands of experts.

One further point under this heading: In all forms of tuberculosis in which there is definite caseation and breaking down of the tissues, tuberculin will accentuate the intoxication if there is no outlet to the necrosed products, and similarly in pulmonary tuberculosis with marked and active caseation, the use of tuberculin accentuates the activity of the process. In some cases this is of value, as it leads to rapid breaking down of a localized area with cavity formation and subsequent healing.

Latham's experience of the last six years, which included several hundred cases, has led him to form the impression that the careful use of tuberculin gives valuable results in the treatment of pulmonary tuberculosis. Its use is not attended with dramatic effect except in occasional examples of febrile disease or laryngeal tuberculosis, nor does its use tend to hasten the apparent arrest of the disease or shorten the length of treatment required, except in certain instances in which the patient is just holding his own but is making no real progress. On the other hand, tuberculin, in conjunction with ordinary methods, will lead to the disappearance of tubercle bacilli from the sputum in a larger proportion of cases than ordinary methods alone, and in his experience diminishes the number of relapses, or, in other words, establishes a higher degree of immunity. In view of these facts, he agrees with those who hold that the best treatment for pulmonary tuberculosis is tuberculin treatment in conjunction with what is called sanatorium treatment, either at a special institution—as is necessary in a considerable proportion of cases—or at home.

THE INUNCTION TREATMENT OF SYPHILIS.

FRESHWATER in the *Practitioner* for April, 1912, tells us that during the inunction course attention should be directed to the following points:

1. *Shaving Hairy Skins.*—Previously to commencing a course of inunction the legs and arms of patients with much hair should be shaved, in order to avoid the occurrence of folliculitis; this is most important, as when it has not been attended to the subsequent results are often very unpleasant, and some patients have to give up their treatment, their condition having been made much worse with the subsequent inunctions.

2. *Teeth.*—The patient should go to his dentist to have all tartar removed and all decayed teeth stopped.

3. *Mouth.*—It is of the greatest importance to keep the mouth and gums in a healthy condition, and free as far as possible from sources of infection. This is accomplished by the employment of a suitable mouth-wash and tooth-paste. The teeth must be brushed after every meal; it is important, in order to avoid lacerating the gums, that a small tooth-brush of badger's hair be employed.

The best tooth-pastes for use during any form of mercurial administration are those consisting of potassium chlorate in a soapy base. For mouth-wash Freshwater orders either hydrogen peroxide 5 vols. or prescribes a lotion containing liq. aluminii aceto-tart. P. G. suitably flavored. The latter is especially to be recommended where an antiseptic and very astringent action is required. The mouth and gums must be thoroughly rinsed with the lotion once every hour; a small flask holding

enough for the day's use may be carried in the pocket. If these conditions be observed the teeth and mouth usually remain in a satisfactory state.

4. *Bowels.*—In order to quickly eliminate the mercury excreted into the gut, care must be taken that the bowels are opened every day; any tendency to constipation should be corrected by the occasional use of a saline purge, such as Carlsbad salts. Mercurial diarrhea may be easily set up if these conditions are not observed.

5. *Diet.*—A liberal diet should be employed, care being taken to avoid articles which have a tendency to produce looseness of the bowels, indigestion, or fermentative changes, such as nuts, salads, pickles, green vegetables with hard stalks, highly seasoned foods, coffee, sweet puddings, or sweet drinks.

6. *Smoking.*—The use of tobacco is forbidden or reduced to the smallest possible amount per diem. Heavy smokers are liable to set up a gingivitis much more easily than the light smoker.

7. *Alcohol* is best avoided, but in those patients with a tendency to loose motions, claret with meals may be allowed.

8. *Urine.*—Previously to beginning the course the urine should be examined for the presence of albumin or casts. If either be present the greatest care should be exercised. In such cases, as a guide to the amount of mercury excreted it is advisable to collect the total amount of urine passed in the twenty-four hours and to submit this to a quantitative test; the normal daily output of mercury as a rule should amount to 0.004 per 1000 Cc. In pronounced cases of chronic nephritis, inunction is contraindicated, but cases of syphilitic nephritis are often markedly benefited.

9. *General Conditions of Living.*—Plenty of fresh air and exercise are very important, but excess and overfatigue are to be avoided. Patients are very liable to contract a chill when under the effects of mercury, and this is often the forerunner of an attack of mercurial diarrhea. The general health should be maintained in as good condition as possible; injections of arsenic are often beneficial and may be given concurrently with the inunction course.

Complications and Their Treatment.—Folliculitis often occurs and is due to pulling on the hairs during the rubbing, leading to irritation in the hair follicles, which subsequently become infected with pus organisms. It is a very troublesome and irritable condition, and until its disappearance frequently renders further inunction of the part impossible. Before continuing the course the condition should be allowed to clear up under a starch and zinc oxide powder or ointment.

Gingivitis is always liable to occur during the administration of mercury by whatever method it may be given. The first sign is seen usually in the region behind the wisdom teeth, and around the central incisors, the mucous membrane appearing dark-red in color, the teeth feeling somewhat longer than normal, due to a commencing periostitis at the root; they rarely become loose unless the condition is left untreated. A little care on the part of the physician will prevent this disagreeable mishap.

Pathologically a gingivitis begins as a superficial necrosis of the epithelium of the mucous membrane of the gum at the free edge of the tooth, caused by a deposit of minute particles of mercury in this situation; a pyogenic infection takes place, which is greatly assisted by an unhealthy condition of the gums from decayed teeth, the presence of tartar, or neglect of the patient.

The treatment of gingivitis is simple, unless a very severe ulceration, etc., is set up due to idiosyncrasy or neglect of the patient. It is generally enough to paint the gums daily, or less often as the case demands, with a 10-per-cent solution of acid chromic or silver nitrate; personally Freshwater always uses the acid. The gums should be dried with cotton-wool, and only the affected parts touched with a probe on which is wound a small piece of wool soaked with the acid. In severer cases, or where the patient cannot attend so often, he uses the acid up to 50 or 75 per cent, care being taken to rinse the mouth thoroughly

after. Smoking is, of course, forbidden. In very bad cases due to neglect or idiosyncrasy the administration of the mercury must be immediately suspended. A bath should be taken to wash off all the mercurial ointment, the gums should be painted daily and the mouth-wash used more frequently — *i.e.*, every half-hour — and the underclothes should be changed. When the inflammation has subsided, the inunctions may be begun again with a smaller dose, such as 2 grammes (3ss). Often these patients gradually acquire a tolerance of the drug.

Diarrhea when it occurs is sudden in its onset, severe, and associated with much wind and blood-stained stools. The treatment consists in giving at once 25 drops tr. opii, repeated in three hours if necessary. The patient should immediately take a bath and change the underclothes. A rest from inunctions is necessary for a few days; later they can be continued again, but with a smaller dose to commence with.

This is then the routine as it should be performed, and is of a vastly different character from that usually carried out.

There is no question as to the value of inunction in suitable cases, especially in nerve cases and parasyphilitic conditions, such as tabes. The benefit to the tabetic is, at times, almost marvelous.

Freshwater regards it as somewhat of a mystery why the medical profession has not taken example from Aix-la-Chapelle with regard to this form of treatment, especially as England sends the largest number of patients a year to Aix-la-Chapelle, to return after a stay of a few weeks much improved.

In his opinion, inunction is not suitable as routine treatment of syphilis, although this method is practiced extensively throughout Germany. It is a very dirty and troublesome method, and takes up a lot of time during the day; it is most suited for severe cases, or when the patient has not to get about his daily business. It is also unsuitable for cases with profuse eruptions or ulceration or where much scarring is present. It must also be noted that some skins show a marked intolerance to mercury, a profuse dermatitis being easily set up; this is, however, of very rare occurrence.

For ordinary cases and as a routine treatment he much prefers the employment of intramuscular injections of mercury, which have the advantage of an exact dosage, painlessness, and relative cheapness. It must, however, be understood that the same attention to detail obtains in the case of the teeth, gums, diet, etc., with the injection treatment as with the inunction.

THE PRESENT POSITION OF SALVARSAN.

An anonymous writer in the *Lancet* of April 6, 1912, writes incisively on this subject. He says that in spite of the eminence of the introducer of the salvarsan treatment of syphilis, the solid scientific basis on which it appeared to rest, and its marvelously rapid effects, like all vaunted remedies (one might say proprietary remedies) this drug has failed to maintain its claims. Where is the *sterilisatio magna* which we were told could be accomplished by a single dose? The advocates of the treatment now resort to several doses and still are not able to prevent relapses. So great is their confidence in the treatment that they recommend it be followed by the disparaged mercurial course!

Turning to the question of safety, the position is equally unsatisfactory. Deaths following its administration are now constantly recorded, and reports come from all over the world that many are never recorded. The earlier deaths were attributed by Ehrlich to the use of the drug in unsuitable cases, when contraindications which he has laid down, such as organic disease of the nervous or cardiovascular system, were present. Admitting this explanation, for the sake of argument, it is only one proof of the dangers of the drug. For in several of the recorded cases the patient showed no signs of the lesion found after death and held responsible. Thus in the case reported by Professor Oltramare, of Geneva, a robust man who had contracted syphilis fifteen years before, desired an in-

jection of salvarsan, although he was free from symptoms. A complete examination revealed no signs of disease. He was given a single intravenous injection of 60 centigrammes, which was well borne. On the third day he complained of headache, and on the fourth day died comatose after several attacks of convulsions. Two of the supporters of the salvarsan treatment ask why not throw some of the blame on the leptomeningitis, chronic bronchitis, and bronchopneumonia which were found post-mortem. Excepting the bronchitis, the evidence is that these lesions were due to the drug. In any case the argument is irrelevant as regards safety, for the man was on examination found not only healthy but robust.

Several other cases have been recorded in the columns of the *Lancet* in which ordinary doses of salvarsan proved fatal to young robust patients. We are unfortunately familiar with the symptom-complex of coma, epileptiform convulsions, and death—termed by Sicard meningotropism—as a result of the injection of salvarsan, and it corresponds exactly to the nervous form of acute arsenical poisoning. Indeed, Mr. Foerster (an advocate of salvarsan, by the way) says that it is "inexplicable except as acute arsenical poisoning." It is curious that it most frequently has been observed after a second dose.

At a meeting of the Société Médical des Hôpitaux of Paris on November 17 last M. Paul Ravaut discussed a series of eight such fatalities, one of which occurred in his own hands. In all a young robust patient without visceral disease was given an ordinary dose of salvarsan which was well borne. After a varying interval a second dose was given, and was followed by vomiting, pyrexia, epileptiform convulsions, coma, and death. The necropsy showed congestion of the brain and other organs, and sometimes small hemorrhages into them. In three other and non-fatal cases an erythematous eruption appeared after the second injection. The advocates of salvarsan attribute them to cumulation. M. Ravaut was compelled to reject this explanation, for in some of the cases the doses were small and the interval between them was many days. Thus, in one fatal case two doses of only 40 centigrammes were given at an interval of forty days. As to the theory of Wechselmann that such symptoms are due to microbes in the distilled water used for dissolving the salvarsan, M. Ravaut points out that he always uses filtered water, sterilized at 120° C. Moreover, in two of the cases the same solution was used for other patients who manifested no symptoms. The only conclusion is that the ill results were due to some idiosyncrasy. Possibly the first injection causes some modification, which leads to decomposition of the second dose. It is not generally realized that an ordinary dose (60 centigrammes) of salvarsan contains such a large quantity of arsenic as 3 grains. It is true that, as in the cacodylates and other organic compounds of arsenic, quantities of arsenic otherwise poisonous can be given in salvarsan usually with impunity, but we have no guarantee that such compounds may not sometimes decompose in the body, setting free a toxic amount of arsenic. On the contrary, we now have evidence that this does occur.

In addition to the form of arsenical poisoning just described, commoner and characteristic toxic effects have been observed—acute fatal nephritis, fatal jaundice, herpes zoster, erythema, melanosis, conjunctivitis, vomiting, diarrhea, and muscular cramps.

In the paper referred to above, suggesting that the toxic symptoms following the administration of salvarsan are due to microbes in the distilled water, the writers have produced evidence only that the immediate and temporary symptoms following the injections—rigors, rise of temperature, and malaise—are due to this cause. They have produced no evidence that symptoms of arsenical poisoning can be so produced. In the extensive use of saline injections in surgery, without the elaborate precautions now enjoined to keep the solution microbe-free, has any one observed arsenical poisoning, or, excepting cases in which enormous

quantities have been administered, any serious effects whatever? Finally, take the theory that the toxic symptoms are due to endotoxins set free in the destruction of the spirochætæ. If true, this would only be another admission of the dangerousness of the drug, for who can gauge the amount of endotoxin that will be set free? But, as Professor Finger has shown, similar symptoms follow the use of the drug in psoriasis and leprosy.

One gets impatient of these ever-changing "explanations" which do not explain, and are only attempts to square the facts with the erroneous teaching that salvarsan is innocuous when given according to rule. They are an insult to the intelligence. In the routine treatment of syphilis salvarsan has shown no advantage over mercury, except rapidity of action; that in permanency it is less reliable; and, therefore, that it is unjustifiable to expose patients to its undoubted risks. It may have a place in exceptional cases which do not yield to mercury.

THE TREATMENT OF PLACENTA PREVIA.

In an article in the *Practitioner* for June, 1912, SHAW reaches these conclusions:

The best method of treatment for both mother and child is, where possible, to leave nature alone, but the doctor must be in attendance until the case is over, as severe hemorrhage may occur at any time. If the hemorrhage is severe, manual dilatation of the cervix and extraction of the child give the best results, but this operation should only be carried out by an experienced obstetrician.

Internal podalic version gives excellent results to the mothers, though very bad to the children. This should always be done if the hemorrhage is severe and the practitioner not sufficiently experienced to perform full dilatation and extraction. The mother's life is always much more valuable than the child's.

Champetier de Ribes's bag, packing the vagina or cervix, and Cæsarian section are not recommended.

With treatment carried out on these lines, very few mothers will be lost; many of the children will be still-born, but the mother must always be the first consideration, and any treatment which increases her risk for the benefit of the child is quite unjustifiable.

THE PATHS OF RHEUMATIC INFECTION IN CHILDREN AND THEIR PROTECTION.

MACKENZIE in the *British Medical Journal* of June 1, 1912, discusses this important theme under several heads.

The importance of protection from local and general infection cannot be exaggerated, and the time has come when the mind of the profession, and more particularly the general practitioner, must turn to the possibility not only of treating rheumatic phenomena in children early, but of preventing their occurrence.

Hypertrophied adenoid tissue in the throat and nasopharynx should be removed in the quiescent stage, and simple congestion of the pharynx, palate, and fauces in a child with a rheumatic family or previous history, or with a rheumatic facies, should always be looked upon seriously, and met with local applications of salicylic acid preparations, together with sodium bicarbonate, sodium salicylate, potassium chlorate, and aperients. A 5- to 10-per-cent of sodium salicylate applied to the tonsils, palate, and pharynx gives a protective film from further contamination, and does not impair the defensive action of the tissues; or a gargle containing 20 to 40 grains to the ounce is equally efficacious. Care should be taken that decayed teeth are stopped or extracted, and the tooth-brush and antiseptic powder should be insisted upon daily.

Inhalation for half an hour, three times a day, of 10 minims of a solution of equal parts of creosote and carbolic acid with a Burney Yeo inhaler is, Mackenzie believes, the best method of protecting the pulmonary mucous membrane.

His experience is that sodium salicylate combined with sodium bicarbonate and rhubarb powder is by far the best protec-

tive treatment in cases in which there is any indication of excess of mucus in the intestine, the alkali acting as a solvent, the rhubarb clearing the offending material away, and the salicylate acting as a sedative and healing agent to the mucous membrane.

His conclusions are as follows:

1. The micrococcus rheumaticus takes the path of least resistance.

2. This may be an unhealthy throat, absorption from which frequently gives rise to general rheumatic infection, including peritonitis and appendicitis, directly through the vascular system.

3. Or it may be localized in the bronchial tubes and give rise to pneumonia, with polyarthritis and endocarditis.

4. An unhealthy condition of the intestinal wall may excite to activity the rheumatic agent, setting up acute rheumatic phenomena with peritonitis or appendicitis as part of a general infection.

5. A mild catarrh is produced at the seat of inoculation, and one or more of three factors in each case are present and promote the inroads of the micrococcus. Either (*a*) the physical resistance, or (*b*) the protective properties of the local tissue, or (*c*) defensive agencies of the blood, are below par.

6. The distinction between acute and subacute or latent rheumatism is mainly due to general infection with the actual rheumatic agent in the former and with the toxins only in the latter.

ASPIDOSPERMIN.

COHEN, writing in the *Review of Reviews* for June, 1912, starts out by saying that the title at the head of this article is probably unfamiliar to many of our readers. Yet it is that of a drug whose potency in well-selected cases is so great that competent authority has termed it "the digitalis of the lungs." From twenty years' use—or more—Cohen can affirm that it is a sovereign palliative (not curative) for the symptom dyspnea, when this is not dependent upon mechanical or toxic causes; and it is sometimes a valuable aid in the partial relief even of these latter forms of distress in breathing. Its great field, however, is in asthma, and while occasionally one meets a case it will not help, such cases are rare. The drug is not official, but ought to be. It has been comparatively little investigated, but such investigations as there are have been made by big men. The most recent laboratory study that he is familiar with, that of H. C. Wood, Jr., dating some five years back, confirms all that has been affirmed clinically. Wood, who was led to his studies by clinical results observed in Cohen's hospital practice, found that aspidosperma quebracho contains several alkaloids, possessing similar, and nearly equal, powers as pure respiratory stimulants. The principal ones are aspidospermin and quebrachin.

Commercially one may obtain aspidospermin in many more or less pure or impure forms; and some disappointments in its use may doubtless be ascribed to inferiority in the preparation. So-called "amorphous aspidospermin" is comparatively inexpensive; but it is an uncertain mixture of uncertain residues left after the crystallization of the less impure alkaloid or its salt. The most expensive preparation—crystalline aspidospermin hydrochloride—is, after all, the cheapest, for it is the most dependable. Whether quebrachin in pure form would be equally potent and trustworthy cannot be said, as it is not easy to obtain for clinical work. The Pharmacopœia should presently prescribe a standard for the pure alkaloid aspidospermin and its salts, after which the other principles of quebracho may be studied to determine the question of relative superiority or availability.

The dose in asthma is from 1/10 to ½ grain (0.005 to 0.03 gramme) every hour or two; then less frequently as relief is manifested. An "average dose"—if there be such a thing—is ⅛ grain hourly. Physicians unfamiliar with the drug should prescribe small doses and proceed cautiously. Should there be no relief in forty-eight hours, the patient will not be benefited by longer trial. Cohen states that aspidosper-

min is not "curative," either of the paroxysm or of the underlying "diathesis" or pathological condition (*e.g.*, vasomotor ataxia or chronic bronchitis), which must, in addition, receive treatment *secundum artem;* but as a palliative, tending to prevent recurrence of "spells" in the night, as well as to relieve constant distress, it is a most valuable adjunct to any basic plan of management.

BACILLURIA.

CAMPBELL WILLIAMS in the *Clinical Journal* of May 29, 1912, states that the treatment of a case of bacilluric cystitis must be suited to the degree of the inflammation present. In the acute cases it is not advisable to resort to local measures until the exalted symptoms show signs of subsiding. Rest in bed, hot hip-baths, and india-rubber hot-water bottles can be advocated with a knowledge that such will give relief. The tenesmus, and to a degree the vesical spasm, may be moderated by the use of morphine and belladonna suppositories. A urine-bottle kept in the bed saves the patient the ever-recurring necessity of getting out to pass water. Plenty of bland fluid should be given to the sufferer to drink. To that end Williams gives alchimella tea. It is made as follows: Put one once of the leaves of *Alchimella arvensis* into a pint teapot. Fill with boiling water. Let stand an hour; cool, strain, decant. Add milk and sugar according to liking. Take one-third portion morning, noon, and evening. It acts like buchu, but does not upset the stomach in a similar manner. Medicinally the following mixture is useful: Helmitol, gr. v; potas. citratis, gr. xx; tinct. hyoscyami, mins. xv; ext. tritici repens liq., ʒij; syr. aurant., mins. xxx; aq. carni ad ʒj. To be taken every sixth hour.

Williams prefers helmitol, which is said to be anhydromethylene citrate of hexamethylene-tetramine, in preference to urotropin or hexamethylene-tetramine. It seems to be more efficacious; and he has used boracic acid in large doses with advantage. But some people's digestion will not stand it. He has given it in 20-grain doses up to three consecutive doses in a single day, and then in 10-grain doses three times in the succeeding day. Camphoric acid gr. x in cachet t. i. d. has been advocated. Salol, phenyl salicylate, gr. v ter in die, is useful, particularly to ring the changes with helmitol should it seem to lose its effect. The main object, however, is to endeavor to make the urine alkaline, or at any rate to reduce its acidity. For it is asserted that if one could keep the urine alkaline the colon bacillus would become sterile and die out, as it is believed to need an acid medium for its existence and multiplication. As so many of these germs are unfavorably influenced by light, it has been suggested that local irrigation of the bladder with radioactive water might be beneficial as well as the oral consumption of the same.

As soon as matters have quieted down and the case has entered into the subacute stage, one may then venture upon the topical treatment of the bladder. At the commencement Williams starts with either boric acid lotion 4 per cent, made with dilute saline solution, which irritates less than ordinary distilled water, or else lotio potas. permang. (gr. ⅛ ad ʒj). If the neck of the bladder and the urethra is cocained before washing out it gives relief to the patient. A few drops instilled within the bladder are highly sedative. Personally Williams prefers a 4-ounce india-rubber bladder bottle for washing out, using small quantities at each squeeze, and making certain by examining the returning fluid in a glass that it is clear from shreds, etc., before considering that he has cleansed the bladder. Of course one cannot see them with potassium permanganate. The bladder should be washed out at least night and morning. After the evening wash-out he throws in a couple of drachms of the following iodoform emulsion, which was concocted for him by Dr. W. H. Martindale. Many patients will not tolerate even Berkeley Hill's iodoform emulsion or others with glycerin or mucilage of tragacanth.

They irritate and produce strangury, and are consequently not retained. He has not found that Martindale's preparation irritates. It is as follows: Iodoform, gr. xx; pulv. tragacanth, gr. iv; alcohol, min. j; normal saline solution, min. cccc.

Throw two drachms into the bladder and allow it to remain there. A little is passed at each micturition. It certainly seems to clear up the urine rapidly, judging from the decrease in sediment and alteration in the appearance of the urine after even one injection. It is well to remember, at least in the later stages of treatment, when nitrate of silver is employed, that one must not use iodoform and silver nitrate at the same time as they form an explosive compound.

In treating the chronic type of bacilluric cystitis one can still use the mixture of helmitol, etc., and in addition give a capsule of sandalwood oil with benefit to the patient. In this variety of the affection one can wash out the bladder, first, with peroxide of hydrogen 5 or 10 volumes in strength. If the urethra is cocained it does not sting. Williams usually throws in 10 ounces as one injection, keeping the catheter *in situ* to liberate any gas should it be evolved in distressing amount. He keeps the peroxide solution in for three to five minutes, lets it out, next washes out thoroughly with boric acid, and then instills some iodoform emulsion. In other cases one can use potassium permanganate solution, gr. j to ij to the ounce, irrigating the bladder with it. The last stage in the local treatment is to wash out with a solution of nitrate of silver. Williams throws in about 4 ounces at a time and endeavors to have it retained for five minutes or so. Then he waits three days, and if no marked reaction has followed its use he repeats the procedure. Of course one has to be guided by the behavior of the bladder and one's own experience as to when and how often it is necessary to repeat the injection. Williams asserts that to cure a bacilluric cystitis it is wise to wash out the bladder oneself and not trust the patient to do it. When the infection has passed beyond the bladder to the ureter and kidney, the treatment resolves itself into vaccinal and medicinal.

Lastly, should the bacilluric cystitis be complicated with vesical calculus, he would always advise suprapubic cystotomy in preference to lithortrity, for one is then able to rest the bladder by drainage, and the thorough irrigation of its cavity is an easy and painless operation. He asserts he has seen considerable and rapid benefit ensue from continuous urethral drainage of bladders infested with the colon bacillus when this is combined with efficient irrigation. But it necessitates that the patient should be confined to bed—a procedure which the average chronic cystitic sufferer objects to.

THE TREATMENT OF DIPHTHERIA BACILLI CARRIERS.

Writing in the *Journal of the Michigan State Medical Society* for June, 1912, Holm asserts that the discovery of a healthy diphtheria bacilli carrier at a time when there is little or no diphtheria in the community is not regarded by epidemiologists as being of much importance. The patient should be instructed in the prophylaxis of diphtheria and efforts should be made to hasten the disappearance of the bacilli, but isolation or quarantine measures would hardly be indicated and would be impracticable.

At times when diphtheria is prevalent, however, infected contacts and convalescent carriers are of greater importance. At such times it is evident that conditions favoring the spread of diphtheria are present, and healthy carriers are at least as important in controlling the infection as those sick with the disease.

Since the discovery was first made that diphtheria bacilli remain in the throat after the clinical lesions have disappeared, efforts have been directed toward hastening their departure by various methods. Many practitioners still seem to believe that the bacilli are affected by injections of antitoxin, and it is largely for the purpose of dispelling this erroneous idea that this pa-

per has been written. Antitoxin not only does not affect the diphtheria bacilli themselves, but the injection of frequent doses of antitoxin at intervals extending over prolonged periods may so sensitize the patient to horse serum as to be positively dangerous. Numerous antiseptics have been recommended for use in various forms as sprays, gargles, inhalations, and as direct applications to the lesions. Such antiseptic treatment is of benefit in limiting the power of infecting others by its action on the superficial bacilli, but experienced observers have concluded that the period in which the patient remains a carrier is not materially shortened, and it appears that in some cases at least the period has unquestionably been prolonged. Injections of diphtheria bacilli bacterins and local applications of serum from horses injected with living or dead diphtheria bacilli have been tried with some apparent success; but none of these methods have come into general use.

Special attention should be given to unhealthy tonsils, adenoids, or nasal growths. Such tissue may at times harbor diphtheria bacilli for prolonged periods. Pegler (1905) reported that he "had several times found that the cause of the lingering presence of diphtheria bacilli could be removed by carefully extirpating every trace of unhealthy tonsil tissue, in which crypts he had found adenoid or nasopharyngeal tonsillar tissue to be the offending cause of the trouble."

It has occasionally been noticed that, following inflammatory lesions due to some other agent than the diphtheria bacilli, these organisms have disappeared from the throat. This brings to our attention the well-known principles of antibiosis, which have been applied in the treatment of several other bacterial conditions. It has been recommended that the mouth be sprayed with suspensions of staphylococci in pure culture, and favorable results have been reported from this procedure. The method undoubtedly is worthy of further trial. They have tried to make cultures of mixed bacteria from a normal mouth to be used in the same way. Good results have been reported from the use of such cultures; but their idea, which was to spray with a culture representing the normal bacterial flora of the mouth, has been abandoned because there appears to be no artificial culture medium which will grow more than a small proportion of the various bacterial species found in the normal mouth.

Apparently there is within certain limits what might be termed a normal bacterial flora for the mouth. These various bacterial species growing symbiotically and maintaining a saprophytic existence undoubtedly afford a certain amount of antagonism against the invasion of foreign organisms. When a diphtheria infection occurs the normal flora is destroyed either wholly or in part during the acute stages of the disease. After recovery the normal flóra is gradually reëstablished and the diphtheria bacilli disappear. If through vigorous use of antiseptics the restoration of the normal mouth bacteria is retarded, typical morphologic forms of diphtheria bacilli may persist for long periods. Thus in several instances the swabs from recovered patients have given nearly pure cultures of bacillus diphtheriæ for months after the throats had apparently become normal. In these cases when antiseptics were discontinued and the throats inoculated from a normal mouth, the normal flora has been reëstablished and diphtheria bacilli have promptly disappeared. The method employed is to inoculate a sterile swab from a normal mouth and rub it over the mucous membrane of the mouth and pharynx of the carrier. No mouth-wash should be used for at least six hours after such treatment, and after that time the mouth-washes used should not be antiseptic. On the second day a swab should be taken for culture and examination. If possible, the process should be repeated.

Holm's experience with this method has been very favorable, and it appears to be well worthy of further trial. The chief objection to its use is the danger of transferring other infections, and this should be carefully guarded against. When cultured bacterial suspensions are used, this danger

is obviated, and if practical experience should indicate that equally good results may be obtained by use of cultures, the advantage is worthy of consideration.

PRACTICAL POINTS IN SEBORRHEA LICHENOIDES AND PRURITUS.

The *Australian Medical Journal* of May 4, 1912, contains an article by Noyes. He says the subjective symptoms usually met with in disordered conditions of the skin are itching, burning, tingling, formication, tenderness, and pain. The most troublesome of them is itching. The term pruritus, about which there is some confusion, ought to be applied to those forms of itching which are not preceded by any obvious skin lesion. "It is a true sensory neurosis due to some functional disorder of the related nerves independent of any source of irritation on the surface."

Itching may be the result of external causes, as the acarus scabei or pediculus corporis, or it may be the subjective symptom of eczema, lichen planus, psoriasis, etc.; or, again, it may be produced by internal derangements of the kidneys, liver, stomach, and uterus, by glycosuria, and by lithemic conditions generally. It may be localized or generalized. If localized, apart from the situations determined by definite local causes as eczema, the most common positions attacked are the anus, the scrotum, and the vulva.

The anus, so often attacked, is in the adult nearly always associated, as pointed out by Crocker, with hepatic derangements, and the local causes, such as constipation and hemorrhoids, which appear to be the direct cause, are dependent upon hepatic disturbance.

The scrotum when involved very frequently has a definite local cause in a modified eczema.

The vulva in the adult is frequently affected, and very often as the result of genito-urinary trouble from the ovaries, uterus, vagina, or urethra, sometimes occurring obstinately at the climacteric period and occasionally during pregnancy. With regard to this pruritus of pregnancy, it may be confined to the genital regions, or it may affect areas at a distance, or may even be more or less generalized. Noyes has observed a few cases of this in which the child, when born, developed a neurosis —urticaria papulosa—with itching as its pronounced tormenting symptom. In all cases of itching in the neighborhood of the genitals, unless some other cause is quite obvious, it is advisable to examine the urine for sugar. Noyes asserts he has seen it so mild as to produce a slight sense of itching about the urethral orifice with a scarcely discernible dermatitis, but, again, so severe as to become almost intolerable, with an accompanying dermatitis extending from the knees to the umbilicus. In these localized forms about the genitals the inflammatory condition of the skin is an important factor in the production of the itching, though in glycosuric subjects the skin may itch far removed from the genitals and without any accompanying dermatitis.

Urticaria produces very marked itching, but it must not be forgotten that itching, or rather the rubbing and scratching for the relief of it, not infrequently itself produces urticaria.

Occasionally pruritus may exist only in the imagination. Noyes has recently had two cases in young adults in whom every conceivable cause was excluded, and in one of whom—a nurse-maid—he is convinced it was a hysterical manifestation, though this mental condition may proceed still further and end in complete aberration. A man under his care at the Melbourne Hospital some years ago ultimately committed suicide, not because the pruritus was intolerable, but because he developed a mental condition not far removed from insanity, of which the imaginary pruritus was one of the earliest symptoms. Crocker, excluding such cases as urticaria pediculosis and scabies, places the causes referred to above in the following order of frequency in the production of general pruritus: Hepatic derangements "as seen in the lithemia of Murchison," jaundice, etc., disorders of the alimentary canal, kidneys, and dia-

betes mellitus, disorders of the uterus, ovaries, and pregnancy.

Keeping in mind what has been said regarding the cause of this nerve-racking symptom, it goes without saying that before complete relief can be expected from treatment the cause must be ascertained, and this often can only be worked out in a systematic way, excluding one cause after another, whether of external or internal origin. Cases occasionally baffle the most experienced, and in such where the primary cause cannot be ascertained the following have been suggested as likely to give some relief: Tincture of gelsemium in rapidly repeated doses, tincture of cannabis indica in increasing doses, well diluted; phenacetine and phenazone, bromides and chloral sometimes give relief.

Whilst pursuing this course local remedies must be used to help alleviate the patient or to relieve the affected area it is the seat of an inflammatory process from the deleterious effects of rubbing and scratching, which determines more blood to the inflamed part, keeping up the process interminably. External remedies may be chosen from terebene, lysol, liquor picis carbonis, benzoic acid, carbolic acid, which are best given in lotion form if a large area is involved. Menthol is useful as an ointment for limited areas or as a soap, which may be lathered over the whole surface if the condition is generalized.

In choosing remedies for pruritus ani, note the local condition—hemorrhoids, constipation, etc.—that may be present, and recognize their definite association and the definite association of pruritus ani generally with hepatic disturbance, and treat accordingly.

Locally, mercurial preparations in ointment form, perhaps combined with one of the external remedies mentioned above, are useful.

Cocaine as a 5-per-cent solution on a narrow strip of lint inserted into the anal orifice often gives marked temporary relief.

It is necessary to remember that many of the "so-called cases of pruritus scroti are really due to an underlying eczematous process which must not be fanned into flame."

Crocker suggests painting on argentic nitrate gr. 10 to spiritus ætheris nitrosi oz. 1, or ung. hydrarg. ammoniati 10 or 20 grains to the ounce, or liquor potassæ drachms 2, acidi carbolici drachms 4, ol. lini. q. s. ad oz. 2, ol. bergamot m. 10 (Bronson's oil).

Keeping in mind all the causes referred to when previously speaking of pruritus vulvæ, it may be possible to cure it without local remedies, though they occasionally give much relief.

The author recommends lead lotion 15 to 20 minims to the ounce; nitrate of silver 5 to 10 grains to the ounce of nitrous ether; a saturated solution of boric acid; but he gives the palm to the plan, recommended by Reeves, of applying every night with a camel's-hair brush the compound tincture of benzoin.

ANTITYPHOID INOCULATION.

In the *Glasgow Medical Journal* for June, 1912, LEISHMAN tells us that as to the use of typhoid vaccine in the treatment of actual cases of enteric fever there is difference of opinion. In some quarters feeling is strongly against it, as it does not, on the surface, seem rational to inoculate a case with more of the germs which are causing the disease. Yet Leishman believes there is good scientific foundation for such treatment, and he has had some first-hand, and a good deal of second-hand, experience with it, amounting to some forty or fifty cases. The conclusion he has reached is that inoculation of cases of enteric fever with typhoid vaccine is a most valuable means of treatment, and that the vaccine therapy of these general infections will in time prove of great use. His experience in treatment was that small doses did no harm, but at the same time did no good. The dose was then increased from 50 to 100 millions every third day, with which excellent results have been obtained. The number of cases so treated is too small to base general conclusions on, but all who had to do with the patients

thought they had benefited greatly. The enteric facies disappeared, the patients said they felt better, and in two or three cases they even asked that the vaccine should be repeated! Also, it seems to reduce the size of the spleen and to increase the flow of urine, which is thought to be a favorable sign. Shortening of the fever is difficult to judge.

As to the temperature, the result of vaccination is to raise the temperature in the following twenty-four hours about 1° F. over what might have been expected, but it soon falls, and to a lower point than before inoculation. About the third day after inoculation it tends to rise again; another injection is given, and the same result follows. And, finally, the temperature touches normal, and remains there.

There has been, in cases treated with the vaccine, a very notable absence of severe complications and of tendency to relapse. He says the method is now being used frequently in the United States. As to the relative advantages of using a stock vaccine or an autogenous vaccine, Leishman thinks that stock vaccine gives better results. As to dosage, very small doses appear inefficient, and, as far as our present knowledge goes, he would recommend starting at a dose of 50 millions, cautiously increasing it to 100 or 150 millions. In his opinion the vaccine treatment of enteric fever is sound practice, and will grow in favor as time goes on.

SO-CALLED DELAYED CHLOROFORM POISONING.

CORNER in the *Clinical Journal* of May 29, 1912, discusses this topic.

A point which he noticed was that the illness of "delayed chloroform poisoning" was more frequent between three and eight years of age than either before or after that age. Subcutaneous injections of atropine were used before anesthesia to prevent the formation of mucus in the mouth and the subsequent absorption of the drug swallowed, and had no influence in preventing the symptoms of delayed chloroform poisoning. It is possible that the anesthetic in part is excreted into the alimentary canal and reabsorbed from it. Therefore it makes but little difference if the drug is absorbed from the lungs or swallowed.

It is clear that a large proportion of children develop acetonuria merely as the result of the altered condition which admission into hospital entails. The real causation is uncertain, but there is reason to believe that the change in the diet or the refusal to take food, which so often follows their admission, are the chief factors. And further, it must be noted that the addition of glucose to the ordinary diet made little difference to the incidence of the acetonuria. The administration of an anesthetic caused the appearance of acetone in the urine in the majority of cases—72 per cent in the wards and practically 100 per cent of the cases in the out-patient department. Here, again, the previous administration of glucose made no great difference to the incidence of the symptoms. Only a few who developed acetonuria after the operation showed any other symptoms. Further, no patient who had already had acetone in the urine before the anesthetic was administered showed any recognizable sign of increased intoxication.

The problem of the occurrence of delayed chloroform poisoning is a very difficult one, and so long as it is necessary to produce anesthesia by the administration of a poisonous drug such as chloroform, so long will cases of delayed chloroform poisoning occur. In other words, if we have to administer chloroform 100 times, we are absolutely bound amongst those 100 cases to have a case (fatal or non-fatal) of delayed chloroform poisoning. There is one very useful item which Corner believes he should not omit. For some time in his ward at the Hospital for Sick Children they have been giving these children, before the anesthetic, injections of morphine and atropine, and that has been found to be very successful. The children have an injection of morphine and atropine about three-quarters of an hour before operation

and require much less anesthetic. To make this more practical Corner mentions the doses: The morphine injection of the pharmacopœia of this hospital is of the strength of 1 grain to 40 minims—that is, about half the strength of the solution of the British Pharmacopœia. And they give it in the proportion of 1 minim to a child of one year, 2 minims to a child two years of age, and so on. The atropine injection of this hospital is of the strength of one grain to 400 minims—that is to say, one-quarter the strength of the corresponding solution in the British Pharmacopœia. The usual doses are as follows: if the child is over five years of age, 4 minims; four to five years, 3 minims; three to four years, 2 minims. Up to three years old they give 1 to 2 minims. In this connection it is of interest to note that children seem to bear this drug with great tolerance, because to a child five years old we administer 1/100 grain, which is the full dose for the adult recommended by the British Pharmacopœia. A child of five takes that dose excellently.

In conclusion it will be understood that the occurrence of this condition called delayed chloroform poisoning is a necessary result from the administration of a poisonous drug to produce anesthesia. We cannot escape the occasional occurrence of the condition of "delayed chloroform poisoning" so long as we continue to administer such a drug to produce anesthesia, and the only power we have is to minimize the frequency of its occurrence. In the preparation of the patient the normal habit of life should be changed as little as possible, and one should particularly avoid purgation and those periods of abstinence from food (or starvation) which commonly form a part of the rule of preparing for an anesthetic. As small a quantity of the anesthetic should be administered as possible, and after it has been administered every opportunity should be given for the excretion of the drug which has been absorbed. The activity of the bowels should be maintained and stimulated, sickness should be rather encouraged than checked, the skin should be made to act, and by diuretics the elimination of the poison through the kidneys should be induced and encouraged.

THE TREATMENT OF SCARLET FEVER WITH SALVARSAN.

In the *Therapie der Gegenwart*, May 12, 1912, KLEMPERER and WOITA record their experiences in the treatment of scarlet fever with salvarsan. They state that during the past seventeen months they have treated 109 cases of this disease, which did not come from one district alone but from many districts, and therefore probably suffered from numerous types of infection. Forty-nine of these cases were not treated with salvarsan; seven had otitis, 21 nephritis, and eight endocarditis. Many of the patients were exceedingly ill, and when a colleague sickened and died in four days, apparently from pure toxemia, they decided to make a trial of salvarsan, because they think it has been shown that in scarlet fever a positive Wassermann reaction is obtainable in a certain proportion of cases. In the last twelve months they have treated 60 cases of scarlet fever, of which 21 were too mild to require drug treatment, and 39 which were severe were treated with salvarsan. Of this number five died, one of the cases being an instance of puerperal scarlet fever following a septic abortion, her death being due to sepsis. One of the fatal cases occurred in a two-year-old child who had whooping-cough and who died of bronchopneumonia. Two other cases when admitted suffered from severe diphtheric and streptococcic toxemia. Only one of the five fatal cases was thought to be due to actual scarlatinal infection.

This number of cases is not sufficient to justify definite conclusions regarding the value of salvarsan, but the authors are under the impression that it is distinctly useful. Its injection resulted in a marked fall of temperature and in aborting the full development of the rash, or at least greatly delaying it. On the other hand, in some cases, the sore throat became worse

and the enlargement of the cervical lymph nodes was noticeably increased. As a rule, however, the sore throat seemed to be controlled. The use of Fowler's solution as a control test showed that its action was not the same as that of salvarsan. The authors noticed, however, that vomiting and diarrhea set in after the administration of salvarsan in most cases, and at times the diarrhea was very profuse. The dose of salvarsan which they used in scarlet fever was 0.1 gramme in the first year; in the second year 0.2 gramme; in older children 0.3 gramme; and in adults 0.5 gramme. The drug was given almost always intravenously.

Klemperer and Woita conclude, therefore, that salvarsan exercises a favorable action in the course of scarlet fever, although they are unable to determine at this time whether it has a specific effect, or to explain its influence. With the exception of a paper contributed to this subject by Lenzman, in which he claimed good results from salvarsan, no other clinical investigations have been made, so they claim.

HYPODERMIC INJECTIONS OF IRON AND ARSENIC IN SECONDARY ANEMIA.

JOHN J. MUSSER, JR., in the *Boston Medical and Surgical Journal* of May 23, 1912, states he has had the opportunity to observe the general condition and to make repeated blood counts in a series of fourteen cases which received, hypodermically, injections of iron and arsenic.

Early in the treatment of anemic patients some of the various Italian preparations of organic salts of iron were imported and used, but the results from their use were not satisfactory. The difficulty and expense of securing these preparations led to the use of a solution of ferric citrate prepared locally. This was used in various doses, but on the whole the results were not such as would indicate a continuation of the treatment. The ferric citrate in doses sufficiently large to give good results was found to be so irritating, and the injection so painful, that the patients for the most part rebelled against the treatment. Also in a few cases there were attacks of vertigo, fainting, and in some cases vomiting after the injection. Then the present formula was secured and so far has given most satisfactory results. The iron is used in conjunction with arsenic and sodium glycerophosphate. The iron and arsenic, of each .06 gm., and the sodium glycerophosphate, .10 gm., are dissolved in 1 Cc. of distilled water. This makes a slightly alkaline, reddish-tinged solution, clear, without sediment. It is placed in small glass ampoules, sterilized, and when sealed is ready for instant use. Each ampoule contains a sufficient quantity for one dose. The few minutes to sterilize the syringe and needle are all the time required to give the injection. It may be given in any muscle, but in the treatment of ambulatory cases the most satisfactory site of injection is directly into the muscles of the thigh or into the deltoid muscle. The solution is so free from irritating qualities that it has not been found necessary to give the injections deep into the gluteal or lumbar muscles. The treatments as a rule were given twice a week, though in some cases as often as daily for a short time. In several cases the injections were only given once a week. With the iron and arsenic, treatment was usually given for the local condition causing the anemia. In some of the cases treatment of the local condition had been carried on for some time without any definite improvement. Upon the addition of the iron and arsenic the results were usually most pronounced. The increase of hemoglobin and erythrocytes brought with it freedom from the troublesome symptoms of before. The amelioration of the symptoms and improvement in the primary trouble usually resulted in the patients discontinuing treatment before it was desirable. In most of the cases the treatment was simply the correction of dietetic and hygienic faults.

Of the fourteen cases treated in this manner, only one failed to respond promptly. This patient, a young married woman,

was found later to be pregnant, and the treatment was discontinued.

The author has had the opportunity of studying the blood in a case of pernicious anemia. Before the treatment began the hemoglobin was 19 and the erythrocytes 950,000 per cubic millimeter. Two months' treatment raised the hemoglobin to 68 and the erythrocytes to 3,490,000 per cubic millimeter.

Musser's conclusions are as follows:

1. The intramuscular injection of iron and arsenic in organic compound is entirely practical in office and dispensary work.

2. It is a valuable adjuvant to the treatment of anemia secondary to some relatively mild condition.

3. It affords a method of giving the drugs in which the exact amount taken is accurately known.

4. It does away with the annoying complications frequently resulting from the administration of the drugs by mouth.

SOME NOTES ON THE DIAGNOSIS AND TREATMENT OF ECLAMPSIA.

SKEEL in the *Cleveland Medical Journal* for May, 1912, writes on this topic and presents the following summary of his views:

1. Albuminuria is the most uniformly present symptom of preëclamptic toxemia.

2. Its persistence, in spite of treatment, is more significant than its quantity.

3. Albuminuria, rise in blood-pressure, and edema are unfortunately "grouped" in their severity.

4. The child's interest in induced labor is identical with the mother's.

5. Eliminate vigorously before starting labor.

6. Whenever under reasonably vigorous treatment the patient does not improve, induce labor.

7. In the presence of actual convulsions: (*a*) If the cervix is open apply forceps or do version; (*b*) if the cervix is closed do vaginal or abdominal Cæsarian section; (*c*) avoid the strain of labor.

8. Gas is the anesthetic of choice for operative procedure, next ether; never chloroform.

9. Avoid undue forcing of hot packs for fear of heat-stroke.

10. Secure time for production of elimination by controlling convulsions with morphine.

11. Ordinarily the high blood-pressure needs no specific attention.

12. The successful treatment of eclampsia requires much personal attention by the physician.

PYELONEPHRITIS OF PREGNANCY.

Writing on this theme in the *British Medical Journal* of May 18, 1912, ANDREWS points out that almost all writers on the subject are in agreement that the treatment of pyelonephritis of pregnancy should be as conservative as possible.

The general treatment consists of rest in bed, milk diet with plenty of harmless fluids to drink, and regulation of the action of the bowels. Violent purgation must be avoided as being likely to cause miscarriage. Some authorities advise administration of small doses of calomel—for example, grain 1/6 t. i. d.

More special treatment includes administration of diuretics, and urinary antiseptics, alteration of the reaction of the urine, etc. Diuresis is secured by administration of infusion of buchu and sometimes by digitalis. Several writers mention distention of the bladder as causing a reflex diuresis. Andrews states he has no experience with this method of treatment. The most popular urinary antiseptic is urotropin, 15 to 30 grains of which may be given daily. As the organisms are growing in an acid medium the urine should be rendered alkaline or neutral. This is done by administration of potassium citrate, 20 to 30 grains t. i. d., or of alkaline waters. Antitoxin treatment has been tried with good results (Dudgeon, quoted by Thomson Walker). Results of vaccine treatment are disappointing, at any rate in acute cases.

Pain is treated by warm applications to

the loins, and if necessary to the abdomen, by administration of tincture of hyoscyamus 30 minims t. i. d., and by exposure. Sometimes great relief is obtained by having the foot of the bed raised one or two feet, while in other cases a sitting posture may be found to give relief. As a rule the pain soon yields to treatment.

Interruption of the pregnancy should be avoided if possible, and expectant treatment always given a fair trial. Some writers emphasize the increased risk of puerperal infection on account of the septicity of the urine, but in Legueu's 52 cases there was no puerperal sepsis. If both kidneys are affected, and the condition does not yield to medical treatment, and the patient's general condition is going from bad to worse, it may be necessary to empty the uterus.

CAECUM MOBILE.

The following résumé of the recent literature on this subject is quoted from the *Edinburgh Medical Journal* for February, 1912:

It is no infrequent occurrence for the surgeon to operate on a case in which the diagnosis of chronic appendicitis has been made and to find the appendix showing no definite pathological lesion. After the removal of an apparently normal appendix the patient is relieved of his symptoms in many cases; in a certain number, however, no relief is obtained.

In 1908 Wilms drew attention to the fact that in most of these cases the pathological condition consists in an undue mobility of the cecum ("cæcum mobile"), that the appendix is only indirectly affected, and that, to obtain complete relief, not only must the appendix be removed, but the cecum must be fixed in the right iliac fossa.

It has been definitely established that the appendix itself has no afferent pain-conducting nerve fibers, and thus very pronounced pathological changes may take place in it without giving rise to pain, so long as the serous coat is not involved and no lymphangitis in the mesoappendix is present. The pain-conducting fibers commence in the mesoappendix, and thus swelling or dragging on this fold produces pain or discomfort. Traction on the mesoappendix, from one cause or another, is thus more likely to give symptoms than is a chronic inflammation in the appendix itself.

Cases of "cæcum mobile" are characterized by chronic constipation, with attacks of diarrhea at intervals, and spasms of colicky pain in the right side of the abdomen, often accompanied by vomiting. On palpation, tenderness, gurgling, a feeling of resistance, and sometimes a firm sausage-like swelling in the region of the cecum can usually be made out. *X*-ray examination after a bismuth meal shows that the bowel content is retained in the cecum and lower part of the ascending colon for twelve to twenty-four hours, or even longer, as if there were some functional obstruction to the emptying of the cecum.

According to Wilms two varieties of movable cecum causing symptoms are to be distinguished. The one is where the cecum is freely mobile but the appendix is comparatively fixed by a short mesoappendix. In such cases a full cecum, sagging down, stretches the mesoappendix, and causes a dragging, painful sensation. In this condition the removal of the appendix will give, as a rule, almost complete relief. The appendix in these cases may become inflamed as the result of kinking; the primary cause of the trouble, however, is the undue mobility of the cecum. The second class of case is one in which the appendix hangs free, has a long mesentery, and is obviously not implicated, but where the cecum is large and movable, and apparently as the result of some chronic irritation in the colon undergoes from time to time spastic contractions which cause pain by dragging on the nerves in the mesocecum. This condition he describes as "typhlospasm." Physicians have shown that such cases may be often relieved of both pain and constipation by the administration of sedative drugs, more especially belladonna, and only after prolonged medical treatment has failed to relieve should surgical interference be undertaken.

The operation performed by Wilms for movable cecum is the raising of a flap of peritoneum from the right iliac fossa so as to form an extraperitoneal pocket into which the cecum is fixed. He has found that not only is the patient's pain relieved by this fixation of the cecum, but that the constipation is cured and the onward passage of fecal matter from the cecum, as evidenced by repeated *x*-ray examinations, greatly accelerated.

Stierlin records 52 cases of "cæcum mobile" treated by appendectomy and cecopexy in Wilms's clinic. In 43 of the cases the after-history was obtained, and 75 per cent reported themselves cured of both pain and constipation, 16 per cent were improved, and 9 per cent still complained of their old symptoms.

Klose distinguishes two varieties of movable cecum which give rise to similar clinical signs. The one variety results from constipation and inflammatory changes in the cecum, and this, if taken in time, may be cured by medical means; the other is the result of arrested development, and always requires surgical treatment. He recommends an intraperitoneal cecopexy for these cases.

Fischer believes that the symptom-complex described by Wilms is accounted for more by an atonic condition of the cecal wall, the result of a local enteritis, than by the mobility of the cecum, and he prefers to designate the condition "typhlatonie."

Bircher has found that the conditions described by Wilms as "cæcum mobile," and by Fischer as "typhlatonie," are clinically indistinguishable, and he treats these cases by coloplication—reducing the lumen of the large cecum by a vertical tuck.

Hausmann, who independently described this condition as "wandering cecum," has made several contributions to the literature on the subject. He treats these cases with oil enemata and abdominal massage, and where these measures fail, by cecopexy.

Sick has found in many of these cases that the appendix has a short mesentery, and forms, as it were, a tether to the movable cecum, and he believes that the painful attacks are due to a partial volvulus of the cecum round this fixed point. He is no warm supporter of cecopexy.

In cases presenting the symptom-complex of Wilms, Hofmeister has demonstrated the presence of adhesions constricting the ascending colon, and by dividing these and thus still further freeing the cecum has succeeded in relieving the symptoms.

Dreyer, from the examination of a large number of bodies, concludes that a movable cecum is not pathological, it being present in 67 per cent of the subjects examined, and condemns the operation of cecopexy as being unphysiological.

Lastly, Hochenegg insists that the symptoms which are usually referred to as chronic inflammation of the appendix are of a purely mechanical origin, and that the trouble which the appendix has been causing in any given case can be gauged only by the anatomical disposition and relations of the appendix to neighboring organs in the abdomen, and not by the degree of pathological change found in the excised appendix.

THE ADMINISTRATION OF NITROUS OXIDE AND OXYGEN AS AN ANESTHETIC.

FLAGG (*New York State Journal of Medicine,* April, 1912) states that this form of anesthesia is advisable because it is safe.

The natural immunity is not affected, nor is the blood harmfully disturbed. There is no tendency to light up latent tubercular foci as in the case of ether. There are no known bad after-effects upon the lungs, kidneys, or any other part of the body. By the method of rebreathing, the presence of carbon dioxide acts as a stimulant to the vasomotor center, preventing shock and reducing a rapid pulse, and the body temperature is preserved.

Oxygen, the best resuscitator, is an integral part of the apparatus. The induction is rapid and pleasant. The recovery is almost immediate and is remarkable chiefly for the absence of symptoms. Without removing the face-piece, ether may be

given by the most approved method. The absence of postoperative sickness insures early nourishment and a short convalescence.

Hewitt, of London, says that "there is no form of anesthesia at present known which is so devoid of danger as that which results from nitrous oxide when administered with a sufficient amount of oxygen to prevent all asphyxial complications."

According to Hamburger and Ewing, whose researches can be found in the preliminary report of the Anesthesia Commission of the American Medical Association, when ether is administered to a patient for even a short operation there is a reduction in the color index which is progressive, reaching its lowest point about the fifth or sixth day. The volume index also shows a drop, which is most marked in the first twenty-four hours, and again on the fifth to the seventh day.

With nitrous oxide the only sign of a low color index is found immediately after the mask is removed and disappears completely in two hours. The volume index is not affected.

It has been recognized for some time that ether increases the toxemia arising from infection. This has recently been shown to be due to the fact that ether impedes the functional activity of the leucocytes, that it lessens the resisting power to infection which normally exists. Nitrous oxide produces no such deleterious effect and consequently increases the chances of a septic case.

The recent work of Dr. Gatch, of Baltimore, based upon the experiments of Professor Henderson and others, indicates the value of rebreathing. Shock has been experimentally produced by overaeration of the blood—that is, by diminishing the carbon dioxide content—and conversely it has been relieved and prevented by the addition of CO_2.

The method which the writer has used is that employed by Dr. Gatch. Over 2500 cases have been anesthetized by this method at Johns Hopkins. It allows of rebreathing, hence is not only of advantage by increasing the carbon dioxide present but also by preserving the body temperature from reduction by the expired air.

From the standpoint of the patient, this form of anesthesia is ideal. He becomes unconscious almost at once, and upon his recovery is often not even nauseated. This satisfactory state of affairs does not end here, for frequently he can take nourishment at once, and as a consequence of this he may leave the hospital at an earlier date. Postoperative abdominal distention is remarkable chiefly for its absence. The innocuousness of the anesthetic, combined with the stimulant action of the carbon dioxide present, allows the intestinal musculature to retain its normal tonicity.

Oxygen, which is the best antidote for overdosage of nitrous oxide, is constantly at hand. The administrator has but to turn on a valve to secure a pure atmosphere of this gas.

When marked muscular rigidity persists it is advisable to add a little ether. It appears from special research along these lines by Dr. Gatch, that many of the ill effects of ether are due to a lack of oxygen and the fact that ether is being given in too great concentration. It should not be given in a concentration of over 7 per cent. The increased pulmonary ventilation which is secured by rebreathing allows of a rapid absorption of this dilute ether vapor with the minimum amount of harm to the tissues and a maximum saturation of the blood.

The ease with which oxygen may be added in conjunction with this dilute ether disposes of the remaining objection to the use of the closed method, namely, anoxyemia or deoxygenation of the blood.

Ether given by the open or drop method is safe because the low temperature brought about by its evaporation limits the rapid evaporation of further either dropped on the mask. The objection to this method, however, lies in the fact that the rate of respiration being increased, the amount of carbon dioxide thrown off is excessive, resulting in shallow breathing and frequently apnea. This condition reacts upon the

quality of the heart action and frequently results in various degrees of surgical shock.

In order to overcome these physiological difficulties the practice of rebreathing is advocated.

CHRONIC COLITIS.

LOCHHEAD (*Edinburgh Medical Journal*, April, 1912) reviews some recent contributions on this subject to the effect that ulcerous colitis as met with in Britain is preceded by long-continued signs of weakness in the mucous membrane of the colon. Some of the cases begin shortly after parturition or abortion. After the weakness comes chronic irritation, with an increased secretion from the crypts of Lieberkühn and a desire to go to stool. Slowly following on the irritation comes ulceration, marked by the presence of blood, pus, and offensive stools, and by a condition of profound toxemia. The lesions rarely give rise to perforation of the bowel or abscess of the liver. The associated toxemia constitutes the danger to life.

It is well to note that the severity of the symptoms does not correspond with the severity of the local lesion, but pain is often a marked feature. Though anemic the patient may not lose flesh, and he may seem to be merely listless and lazy, though the sigmoidoscope reveals a serious lesion. The anus loses its tone, and as soon as it is dilated a foul-smelling discharge escapes. The blood-vessels of the mucosa bleed easily when they are touched. The general condition depends on the toxemia, of which the temperature forms a trustworthy guide. The urine may show the characters associated with chronic Bright's disease. Occasionally colitis leads to a generalized peritonitis or localized abscess.

Three clinical types of the disease are to be distinguished: Grave cases with diarrhea or hemorrhage; less severe cases of mucomembranous colitis, ulcerative or not, with spurious diarrhea; and cases of dry colitis, with constipation as a more or less marked symptom.

Segond holds that surgical treatment is never indicated at the outset, but should only be undertaken in a grave case in which medical treatment has proved a failure. On the other hand, operation should not be looked on merely as a last resort in apparently hopeless cases. It ought to be practiced before the large intestine has become greatly thickened and sodden with inflammatory products. If it fulfils its promises, appendicostomy will come to be performed at an earlier stage than at present, to aid medical treatment. Acute exacerbations coming on in the course of the disease, grave hemorrhage, and threatenings of obstruction are further indications for operative treatment.

The principles on which the surgeon acts are to keep the diseased bowel at rest by procuring deviation of the intestinal contents, as in ileosigmoidostomy and the establishment of an artificial anus; to cleanse the canal by copious irrigations and to act directly on the lesions by medicinal agents, as in appendicostomy and cecostomy. Along with these measures an attempt should be made by means of vaccine therapy to render the tissues immune.

The establishment of an artificial anus has usually been carried out too late, and the mortality has been high. As it is difficult to ascertain how far up the colon the lesions extend, and ileostomy is not to be recommended, colostomies should be done as seldom as possible. A cecal anus is best, and this mode of treatment will always have a place in urgent cases, to afford immediate rest to the colon. The early results of cecostomy are good, but the permanency of the improvement is doubtful, and it is only rarely that the artificial anus can be closed, unless ileosigmoidostomy is first performed.

For the treatment of colitis by ileosigmoidostomy, it is essential that the rectum and sigmoid flexure should be free from disease, hence in dysenteric colitis, which furnishes the majority of surgical cases, it is usually contraindicated. In certain cases of mucomembranous colitis, and in those in which constipation is the predominating symptom, it may be performed at the out-

set, but Segond thinks that even in these conditions it is advantageous to begin with appendicostomy, and only if it fails to have recourse to ileosigmoidostomy. With regard to technique, the space between the apposed mesenteries of the ileum and sigmoid colon should be obliterated by sutures to prevent the risk of subsequent strangulation. In cases of stricture of the colon or tumor around it, it may be necessary to combine ileosigmoidostomy with partial resection of the colon. At present total colectomy is still on its trial, but Segond is of opinion that the incurable nature of ulcers of the large intestine, the profound changes in its wall, and cicatricial kinks may indicate the performance of an extensive, if not total, colectomy.

Except in extremely grave cases in which cecostomy is preferable, appendicostomy or fistulization of the cecum is the operation of choice.

SURGICAL REMOVAL OF TONSILS.

FOSTER (*American Journal of Surgery*, April, 1912) describes the tonsil as an encapsulated organ lying in a bed of loose connective tissue in the tonsillar fossa, bounded anteriorly and posteriorly by the faucial pillars. The anterior pillar contains the palatoglossus muscle. Inwardly from this muscle the pillar continues as a band of mucous membrane and joins the surface of the tonsil; it is this mucous membrane band which we perforate with the tip of the finger to gain admittance to the capsule. It is in evidence in prominent tonsils, but is folded upon itself between the pillar and tonsil in buried, atrophic, and cicatricial tonsils. The posterior pillar contains the narrow, sheath-like portion of the palatopharyngeus muscle; above, the pillars joined to form the supratonsillar fossa, the frequent location of peritonsillar abscess. In small cicatricial tonsils it is sometimes necessary to gain admittance to the capsule through this recess.

The outer wall of the tonsillar fossa is composed of the superior constrictor muscle of the pharynx.

The main blood supply is the tonsillar artery, which enters the organ at the pedicle —the lower anterior part. The branches follow the connective tissue sheath and give off a supply to each follicle and to the papillæ of mucous membrane and divide into a meshwork of capillaries.

In a recently enucleated tonsil these branches can be seen following the capsule. The blood supply of the tonsil itself is limited, while the pillars have a rich blood supply.

The surface of the tonsil shows from ten to twenty crypts which penetrate the body to its sheath, and at the bases of these follicles are active mucoid glands. If the tonsil is buried the secretions are retained.

For enucleation he prefers general ether anesthesia, placing the patient to the degree of loss of reflexes in the dorsal position. The first and most important step to insure proper enucleation is to gain admittance to the capsule through the mucous membrane band, which is the continuation of the anterior pillar. This is done by placing the tip of the right index-finger on the above-named mucous membrane fold of the right tonsil at its equator.

The operator now directs a few sweeps outward and forward, separating the anterior pillar from the capsule. Ordinarily a slight amount of force only is required, but in atrophic and cicatricial tonsils a fair amount of force is sometimes necessary.

After the important step of reaching the capsule has been accomplished the distal phalanx sweeps upward, outward, and then backward around the capsule as far as the posterior pillar. Now the globe is drawn forward to avoid tearing the posterior pillar, and the finger sweeps around the base. The tonsil is retained in the throat only by the small pedicle. If the tissues are not too fibrous the pedicle is freed by the index-finger, or by it with the assistance of the thumb; but in very fibrous tonsils the volsellum is used to draw the tonsil through a small snare, and the pedicle is freed close to the wall of the throat.

In order to free the pharynx of blood the patient is quickly turned face downward

(by the anesthetist or nurse) to allow the blood to escape. No sponging is required.

In ordinary cases the time needed for the complete operation does not exceed two minutes. The tonsils are removed entire, and in fifteen hundred cases in which the writer has employed finger enucleation no serious hemorrhage has occurred.

COMPRESSION OF THE LUNG IN TUBERCULOSIS.

LAPHAM (*American Journal of the Medical Sciences,* April, 1912) observes that there are hopeless cases of pulmonary tuberculosis which cannot recover with ordinary methods of treatment under the most favorable circumstances. There are also cases that are unable to hold a recovery after it has been made. In these cases, if the lung can be compressed, and kept so for a sufficient length of time, recovery will usually follow. Fifty per cent of advanced cases treated by compression have been reported as permanently cured.

The durable nature of the recovery under this form of treatment is worth considering. Instead of the uncertain restraint of an encapsulating process, with all the dangerous factors of the disease merely rendered latent, we have their complete and permanent removal, and as a result the lung becomes healthy and clean. The disappearance of the tubercle bacilli removes a source of infection months before it can be accomplished in any other way.

The course of recovery is helpful subjectively. The certainty and precision of the method permit a great deal of liberty and the sense of security gives buoyancy to the patient.

When should we attempt to compress a tuberculous lung and when not? If complications exist, sufficient in themselves to forbid recovery, it will avail little to compress the lung. If the sounder lung is not too much involved, it may be greatly benefited by the removal of toxins from the other lung. At present it is generally agreed that only advanced and hopeless cases are suitable for the method. Forlanini, however, urges its use in early cases. Murphy says that the method is preëminently indicated in the early cases because they forestall practically the only obstacle to success, namely, pleural adhesions.

A lung that is not densely infiltrated and has no adhesions is easily compressed, and the results are brilliant. The dangers and difficulties increase in direct proportion to the amount of lung infiltrated and held out by pleural adhesions, to the degree of obliteration of the pleural cavity, to the distention of the pleural vessels, and to the amount of clotting that has occurred in the pulmonary vessels.

A conservative plan is to give the patient every opportunity to recover by the usual methods, provided always there is no danger in waiting. If, after persistent efforts, the temperature cannot be reduced, nor the extension of the process checked; if after making a good recovery the patient is unable to hold it, but loses whenever any physical effort is made; or if there is some complicating factor, like vicious menstruation that predestines failure—then an attempt to aid the patient by compressing the lung seems amply justified.

THE RESULTS OF DORSAL ROOT SECTION IN THE TREATMENT OF THE SPASTIC STATE OF CEREBRAL DIPLEGIA.

CLARK and TAYLOR (*New York Medical Journal,* April 13, 1912) summarize the results obtained with dorsal root resections as follows: In none of the operations in which Sherrington's law has been observed, namely, not more than two consecutive roots being cut, has there been any anesthesia. It must be left an open question, at present, whether or not certain sensory disturbances are to be invariably anticipated after more extensive resection.

In almost all cases some degree of ataxia succeeds extensive resection of dorsal roots in the lumbar region. The ataxia, however, is not great or lasting, as the heightened reflex from a pyramidal disease supplies an element wanting in the somewhat analogous ataxia of the disease of tabes. More-

over, as Foerster justly remarks, an ataxic gait is decidedly to be preferred to inability to stand or walk. In none of the cases has this mishap befallen the operation.

According to experimental data at hand, atrophy would not be expected to occur as the peripheral nerve has its trophic center, the ganglion, intact.

Clark and Taylor believe the operation in the future should be largely confined to Little's disease. As to the results of dorsal root section in detail, spasticity is more or less completely removed at once by the operation in all cases of Little's disease.

As to reflexes the ankle clonus is usually abolished at once and permanently in all cases. The patellar reflexes are not always abolished. The Babinski persisted, as did Oppenheim's tibial reflex. The Achilles reflex was lost or markedly diminished in all the typical resections. In two cases in which ankle clonus persisted the Achilles reflex was also present. The effect, however, of radiculotomy is of theoretical rather than of practical interest.

The abolition, or at least marked reduction, of the defensive flexion reflex is absolutely necessary and has been obtained in nearly all cases. Its marked continuance indicates a failure in the operation. A pathological increase of this reflex causes the irrepressible flexor cramps in diplegics. They are extremely annoying and often painful to the little patients. If no other causes were in evidence, this one alone would prevent walking and standing in the vast majority of cases.

The associated movements disappear entirely, or are diminished to such an extent that children can raise themselves from the recumbent position to the sitting posture without help.

Varying degrees of voluntary movements are reëstablished in all cases. Unfortunately no one can tell just how much of the paretic element is present in a given case until the spastic element is removed by operation. In those cases retaining the most corticospinal fibers the greatest motility is restored. The ideal case is one in which normal locomotion is present before the development of the disease. In congenital cases—those usually encountered—other central nerve lesions are more often in evidence than those of the pyramidal tracts, especially those of cerebellar or frontal injuries, and in such we encounter ataxias at the start. A longer and more painstaking after-training is necessary. The striking advantages of the withdrawal of the associated movements by dorsal root section is at once obvious. The ultimate results in all cases operated upon will rest in no small degree upon whether or not the muscular contractions are due to the direct influence of trophic changes in the muscles and increased reflexes and the persistence of the after-training. Decided trophic changes in muscles, joints, and bones make for poor prognosis even with the most intensive form of training. In other words, the ideal case for radiculotomy is one without contractures and atrophies in early life (five to eight years of age), without much mental defect, and one in which the paretic component is at a minimum. It is precisely in mild types of Little's disease that these conditions are fulfilled.

TREATMENT OF TUBERCULOUS PERITONITIS.

CAIRD (*Edinburgh Medical Journal*, April, 1912) notes that the findings in abdominal section differ in degree, and consist of a series of types which run into one another, but which may be roughly grouped as follows:

1. Cases in which fluid predominates—the ordinary exudative form, or this form plus adhesions, the exudate becoming at times encysted.

2. Dry forms without fluid, with or without adhesions.

3. Dry forms in which the peritoneal cavity is practically obliterated or tubercle has invaded the bowel coat, passing from the serosa.

The majority of the author's patients had already been treated in the medical department without much benefit, and so were referred to the surgical side by the physi-

cian. Surgical treatment consisted in an exploratory mesial incision midway between the umbilicus and the symphysis pubis, or, as occasion seemed to demand, in the linea semilunaris or appendicular region. An attempt was made to find and remove any prominent focus, but no labored or prolonged search was ever regarded as advisable, and on few occasions were tuberculous tubes and ovaries removed or masses of infiltrated omentum. In such cases, or when the exudate was distinctly purulent, drainage was adopted for a short period. As a rule the abdomen was at once closed after evacuating the fluid and freeing such adhesions as could readily be separated. The dry and adhesive form called for operation on account of localized tenderness and the persistence of general symptoms. It was frequently encountered where one expected to meet with an encysted collection of fluid. Manipulative care had to be exercised on incising the thickened peritoneum, which was frequently almost inseparably blended with adherent intestine. In one patient despite special vigilance the bladder was opened. It lay 1½ inches above the pubes and was fused with the peritoneum. In three other cases the separation of adhesions between the coils of intestine—the serosa of which was infiltrated with tuberculous nodules—necessitated a double enterectomy in order to remove large portions of friable gut. These cases made a perfect recovery despite the adverse conditions. Fecal fistula followed simple exploration in two of the purulent cases; one recovered, the other died at home.

As to the immediate results, 28 cases recovered. There were three deaths, all among the exudative type. In the dry form, which is not generally regarded as favorable to surgical interference, all recovered.

With the exception of these fatalities, and a couple of patients in whom healing was not followed by marked relief, all the others received benefit from operation.

As to the end results, but eighteen of the patients who left the hospital healed could be traced. Nine died at varying periods. Eight are known to be living and well, one two years after operation, one three years, one four years, four five years, one nine years.

It is mainly by the ultimate result that the value of treatment is to be gauged, and even if our ultimate results are not brilliant they more than warrant the procedure. We have to bear in mind that the general state of patients suffering from tuberculous peritonitis is below par; their powers of nutrition and resistance are low, and the subjects referred by the physician for surgical aid have not greatly profited by previous treatment. Hence the mortality is, all things considered, far from excessive. The writer does not advocate with König that every case of tuberculous peritonitis should be under surgical care, nor yet will he admit with Borchgrevink that no such case should quit the physician's hands. It is only when medical means fail or appear to be of doubtful utility that surgical intervention is required. It would, however, be advantageous to know precisely what success attends the physician in his treatment of a series of cases in the adult. Caird confesses, and states that he is perhaps to be blamed, that he did not adopt tuberculin or other than general hygienic measures—adjuvants during or after hospital care.

It is doubtful to what extent the dry varieties of tuberculous peritonitis may be regarded as stages in the cure of exudative forms, since the writer has only met with one instance where there had been a preceding exudate.

The curative effect of laparotomy has been ascribed to various factors. The removal of a passive injurious effusion, thus relieving the general tension, the favoring influence of the succeeding hyperemia, the outpouring of an active antibactericidal fluid—each or all may play its part. That cell proliferation is encouraged appears evident, and amongst other observations one may recall that of Bumm, who noted the microscopical appearance and the number of bacilli in the tubercles at a certain

laparotomy. He had occasion to reopen the abdomen shortly afterward, and in the tubercles then removed for examination an invasion by lymphoid cells was observed and a disappearance of the bacilli.

OPERATION FOR ANEURISMAL VARIX.

DA COSTA (*Annals of Surgery,* April, 1912) reports an interesting case of an aneurismal varix of the popliteal artery cured by suture of the opening into the artery from within the vein, transverse division of the vein on each side of the opening with utilization of the isolated portion of the vein wall for a superimposed flap which was laid over the line of sutures in the artery, and union of the vein by end-to-end suture.

A longitudinal incision about six inches in length was made over the left popliteal space, and the vessels and the nerve were dissected free from the surrounding structures from above downward to the center of the space. It was found that the vein and artery were directly fused somewhat below the center of the space. There was no intervening sac. The artery distal to the point of fusion was small, but proximal to the same point was much dilated, though not saccular. The vein distal to the point of fusion was very much dilated and much thickened. How far this thickening and dilatation extended could not be determined. The vein above the point of fusion was also enlarged and thickened. A longitudinal incision was made on the outer side of the vein, the opening into the artery found and sutured. The suturing was effected by means of interrupted sutures of No. 0 iodized catgut passed vertically and like Lembert sutures.

On tying the sutures, it was found that so much of the vein wall had been drawn in by the stitches that the caliber of this vessel was greatly lessened. Therefore the vein was divided transversely on each side of the point of fusion to the artery, and this portion of vein wall, about an inch in length, was used as a flap and superimposed over the suture line in the artery and was sewed to the artery by catgut stitches. The two ends of the vein were then brought together. As the lower end of the vein was the larger, the upper end was invaginated into the lower end and fixed there by four catgut sutures. The junction was reënforced by a few catgut sutures passed through the external coat of the vein at the line of junction. The tourniquets were removed and the blood jumped into both vessels. The blood in the vein was moving toward the body. The artery pulsated strongly and there was not a bit of leakage. Bleeding vessels in the popliteal space were caught and tied. The wound was closed by silkworm-gut sutures and no drainage was employed. The knee was placed in a position of semiflexion over pillows.

The patient made an uninterrupted recovery. A week after the operation the stitches were removed, and day by day the leg was straightened out a little. For a couple of weeks the leg swelled a little, but never notably.

THE END-RESULTS OF FORTY-ONE OPERATIONS FOR INTERNAL DERANGEMENTS OF THE KNEE-JOINT.

SHORT (*Bristol Medico-Chirurgical Journal,* March, 1912) reports fifty-six cases of internal derangement of the knee-joint out of a total of 22,782 surgical in-patients. An after-history has been obtained in forty-one instances. It is noted as remarkable, though in accordance with the experience of surgeons elsewhere, that in at least thirteen operative cases very little deviation from the normal could be found at the time of surgical intervention. In some of these the cartilage was rather loose; in others it was frankly described as normal. As half the cases yielded an excellent result, we must presume that no other abnormal condition was overlooked in these at least, although in one or two cases it is possible that a loose body or synovial fringe was missed. Why knees with little or no recognizable abnormality should produce swell-

ing and attacks of locking persisting over many months is not very evident.

In twenty cases there was an obvious tearing or loosening of one or other semilunar cartilage; in two it was the external and in eighteen the internal that was at fault. The abnormalities were very various. In seven cases the internal cartilage was split. In three cases the internal cartilage was not torn, but very loose. There were one or two instances of each of the following: Anterior end torn free (two), posterior end torn free (two), external cartilage left attached only at ends (two), internal cartilage torn across middle (one), left attached only at ends (one) or only in front (one), anterior part torn away from capsule except at the extreme end in front (one).

The loose bodies were usually composed of bone and cartilage (five cases) or cartilage only (four cases). In one instance the body was derived from the internal semilunar cartilage; in several cases it was noted that there was a depression on the femur from which a piece of bone and cartilage had separated. In several cases there was a loose fibrous attachment. Once there were two bodies present, and such difficulty was experienced in getting hold of the second that it had to be left. No after-history is available. A remarkable case in which both knees were full of melon-seed bodies is not included here.

The relation to injury was very definite in nearly all cases. It is precisely stated that in nine patients the cause was a football accident, and in another the game was hockey. Probably there were others besides these.

As to the results of operation in the whole series of forty cases, excluding one in which the clinical picture was quite unlike that characteristic of internal derangement, in twenty-five they are described as excellent, in seven good, in four fair, in four bad. There was no operative death.

There is a remarkable and significant difference between the results in the second and third classes. Where a damaged cartilage was found and removed the operation was extraordinarily successful, and there was not a single failure. On the other hand, when a loose body was removed, there were three unsatisfactory results, and only two quite recent cases could be classed as excellent.

Six patients mention that they now are able to play football again; several are miners, and one is a sailor. One miner is able to do his work without inconvenience after removal of a cartilage from both knees.

A CASE OF SYPHILITIC REINFECTION WITH THE WASSERMANN REACTION STILL POSITIVE.

GITTINGS (*British Medical Journal*, April 20, 1912) reports an extraordinary case from the fact that it was apparently a syphilitic reinfection when the Wassermann reaction incident to a previous infection was still positive. The patient contracted syphilis in 1909, and was treated for two years by inunction of mercurial cream. Thereafter his blood was examined by two laboratories, both reporting positive Wassermann, whereupon his doctor ordered his patient to have a further course of treatment. During this interval the patient directed the doctor's attention to an old scar which had recently come into prominence, exposure having occurred five weeks before. The patient was placed upon hydrarg. cum creta gr. iij ter die, but six weeks later the old scar broke down, exhibiting an appearance like primary chancre. The serum from this sore almost immediately revealed the spirochæta pallida.

STEREOARTHROLYSIS.

Under this title TAYLOR (*Surgery, Gynecology and Obstetrics*, April, 1912) describes that branch of arthroplasty whose object is to loosen stiff joints and produce new joints with mobility, following ankylosis. His communication should be regarded as purely preliminary. After a review of the literature of arthroplasty, he notes as an essential in forming a new joint that the ankylosis must be broken up,

either by force or cutting asunder the components of the new joints. There must be an appreciable space between the bones composing the proposed articulation. Except in those cases in which a simple agglutination has occurred between the synovial surfaces, and no pronounced thickening of the synovial membrane or capsule or any necrosis of cartilage and bone has occurred, reunion will unfailingly recur, when ankylosis is broken by force. Hence, after true fibrous or bony ankylosis is broken up something must be interposed between the opposing denuded surfaces and remain there until such time as the denuded surfaces have healed and will no longer readhere or grow together.

This "something" must be innocuous, of sufficient thickness and toughness to prevent contact between the opposing surfaces, filling every nook and cranny in the proposed joint; it must be absorbable, but not absorbable with such rapidity that it disappears from the newly-formed articulation before all granulations have healed. A "something" is necessary that can be put into the newly-formed articulation in a liquid form to fill all crevices, that will rapidly congeal and harden, and when in liquid form will be at such a temperature that no scalding of the tissues can occur, and, at the same time, at body heat will not soften sufficiently to spread and allow contact between the bones.

Taylor in the solution of this problem used a number of substances, among them wax, lard, tallow, lanolin, and cocoa-butter. The animal experiments have proven the feasibility of the procedure. The first case, one of rheumatoid arthritis, nine years old, was operated on twice, the ankylosis being broken up in the knee-joint by means of an osteotome and a periosteal elevator, and the necrosed bone being curetted away at the eroded points; also the diseased cartilage. The patella was chiseled free. The articulation was filled with a mixture of wax 1, lanolin 5, cooled down to about 108°, an abundant supply being put between the patella and femur, after which the joint was held at an angle of 45 degrees until the paste hardened, when the synovial membrane was sutured (also capsular ligament) with continuous silver wire. The leg was put up in a plaster-of-Paris cast at an angle of about 45 degrees. This was removed in one week and the leg was manipulated under anesthesia, after which the patient was put up in traction. At the end of the second week, primary healing having occurred, all dressings were removed and extended manipulation attempted, but this was too painful, so at the end of the third week the patient was anesthetized the second time and the knee manipulated, it being found that there was only about 35 degrees of motion, but the patella was freely movable; the limitation of motion between femur and tibia was due to malformation and transformation of the articular ends of the bones, and not to adhesions.

The knee was opened again, and a large portion of the articular surface of the external and internal condyle was chiseled and curetted away, also a small portion of the articular surface of the tibia, leaving a gap of over one centimeter on both inner and outer margins of the joint. Much of the capsular ligament was removed, but the crucial and lateral ligaments were preserved. The joint cavity was then filled with paste preparation, which was injected as a liquid. The paste consisted of the following proportions: Yellow wax, 1 part; mutton tallow, 2 parts; castor oil, 2 parts; with 15 grains to the ounce, by weight, of bismuth subnitrate. This wax melts at 140° F. (60° C.), is semisolid, and begins to congeal at 128° F. (53° C.). The mixture should be drawn up in the syringe again and again to get a uniform suspension of the bismuth, and for cooling purposes.

The bismuth is for the purpose of enabling *x*-ray pictures to be taken. Three weeks after operation the patient had between 30 and 40 degrees of voluntary flexion with little pain.

The second patient, one of tuberculosis of the right knee, ankylosed firmly in full extension, exhibited one month after op-

eration voluntary flexion of about 60 degrees.

The writer calls attention to the entire absence of fever resulting from the unirritating nature of the interposed substance, nature tolerating it well. Voluntary active motion is soon possible, as it is practically painless, and the range of motion, if sufficient fibrous and osseous tissue is removed at the time of the operation, should approximate normal limits as soon as the involuntary muscular rigidity from the patient's timidity will permit. Reformation of adhesions has not thus far been demonstrable, even under anesthesia.

Lanolin 2 parts, and wax 1 part, forms a smoother articular wax than when combined with other substances and less likely to form hard, lumpy masses under the skin incision. The mistake should not be made of putting too much wax into the joint, only sufficient being used to separate the eroded surfaces.

CURE OF HYDROCELE BY LYMPHANGIOPLASTY.

CHATTERJI *(Indian Medical Gazette,* April, 1912) suggests the following operation in the cure of hydrocele, although he adduces no clinical cases in proof of its value:

The patient is prepared in the ordinary way. The part is shaved and cleaned on the previous day; when dry, pure tr. iodi is painted on and covered when dry with sterile gauze and bandage. On the operation table another application of tr. iodi is made. A medium-sized trocar and cannula is used, the hydrocele being tapped anteriorly a little lower than the middle of the swelling. A strong flexible probe or needle is threaded with 12 or 24 inches of three- or fourfold No. 10 or 12 tubular silk. This is introduced into the sac through the cannula, made to pierce the tunica vaginales and (as far as can be estimated) infundibuliform fascia, cremasteric fascia (int. obl.), intercolumnar fascia (ext. obl.), and dartos, and made to insinuate between the dartos and the skin of the scrotum and led upward toward the inguinal region. Halfway to Poupart's ligament the needle is brought out through the skin and reintroduced and led to the inguinal region, where it is made to emerge. The silk is then pulled through by the needle, if necessary with the help of a pair of forceps, and the end hanging out of the cannula is introduced for a fair length into the sac, the scrotum being so manipulated that the four ends of silk spread out inside the sac. The inguinal end of the silk is pulled up and cut short so that the cut end sinks deep under the skin. The punctures are sealed with collodion and a light dressing applied. The silk is bisterilized and gloved hands are used, or the hands after a complete course of cleansing are dried and painted with tincture of iodine.

Rest with support of scrotum on a bracket for three days is enjoined, and then the patient is allowed up with the scrotum supported.

The rationale of the operation is based on the principle of internal drainage of the serous cavity by the capillary action of the silk threads which act like artificial lymph-channels. The writer states that he has drawn his idea from Mr. Sampson Handley's Hunterian Lecture, 1910, on Surgery of the Lymphatic System, where he describes an operative treatment for ascites by "internal drainage by silk threads." His operation of lymphangioplasty for lymphatic edema is on a similar principle. The author states that Mr. Handley has published one case with successful results for ascites.

AN OPERATION FOR THE CLOSURE OF CLEFT PALATE BY GRADUAL PRESSURE.

SHEA *(International Journal of Surgery,* April, 1912), after calling attention to the fact that one may change the character of a person by correcting abnormalities of the face and jaws, states that it is almost a crime to permit deformed patients to go unrelieved. He advises an operation which he states is applicable any time during the first year and preferably during the first

six months of life. He passes a needle threaded with strong silk through the superior maxilla at a point just under the malar process, and high enough to be above the palate. By means of this thread the free end of a compression bar is drawn through the bones. This bar is made of gold and platinum wire of about 18 gauge, threaded from both ends toward the center. The length of the bar is adjusted to the case. The bar is held in position while lead gaskets, silver plates, and nuts are adjusted, the plates and gaskets being trimmed to fit the convexity of the buccal surfaces of the bones. Nuts are screwed on the outside of the plates on the bar, with a small wrench, until a slight degree of pressure exists. The surplus ends of the bar are snipped off whenever they protrude sufficiently to interfere with the tissues on the inner side of the cheek. To the anterior end of the silver plates are soldered two small hooks for the purpose of reducing the premaxillary bones when they are involved. This is done by passing a rubber band through a small ring which has been soldered to a piece of silver suitably formed to fit the convexity of the premaxillary bones. The free ends of the rubber band are attached or slipped over the hooks on the anterior portion of the buccal silver plates. He depends upon the pressure from the elastic band to gradually reduce the premaxillary bone. It is often necessary to cut a "V" from the vomer in order to get the premaxillary bone in position.

The length of time required to bring the margins of the cleft in close enough apposition for scarifying and suturing will depend upon the age of the child and the amount of resistance offered by the osseous tissue—approximately two weeks.

The nuts used on the compression bar are of gold made with a fair-sized flange for the purpose of pressure distribution. When the margins are sufficiently close to scarify and suture the patient is again anesthetized and the closure of the cleft is completed, leaving in position the compression bar to relieve tension until union.

Special attention should be given to the nasal fossæ so that there will be no crowding of the parts.

The compression bar is flexible, and an anesthetic is not required to remove it.

APOPHYSITIS OF THE OS CALCIS.

SEVER *(New York Medical Journal,* May 18, 1912) draws attention to the fact that there is a painful condition of the heel often called to one's attention which always occurs in children, generally those who are over weight for their years, are physically active, and have strong muscles.

The child is usually seen on account of a slight persistent limp, with a marked disinclination to complete the full step in walking. There is also tenderness complained of about the posterior aspect of the heel, low down, which has persisted for several weeks or months without change. The child has usually worn a low shoe or sandal, with either a spring heel or none. There may or may not be a history of injury, but the child is generally well over weight for its years, has been very active, and is strong physically. There also may be a slight amount of pronation of the foot. That the condition may also be secondary to undue shoe pressure on the heel from a tight or too close fitting counter has not been determined.

An examination shows a moderately tender area on pressure over the posterior portion of the os calcis, deeply situated, and localized in front of the tendo Achillis on either side. There is invariably moderate porky thickening about the whole posterior portion of the os calcis, with some tenderness, and with partial obliteration of the hollows on either side of the tendo Achillis. The motions of the foot are all slightly limited, especially in full dorsal flexion, and any movement which tends to put a strain on the tendo Achillis causes pain. There is pain and tenderness on weight-bearing when the heel is put on to the floor, but less so when walking on the toes with the heel elevated.

The disease resembles somewhat the condition known as achillobursitis, an inflam-

mation of the bursa between the tendo Achillis and the os calcis, but is much more extensive and deep seated. There is also to be considered before making a diagnosis the condition of tenosynovitis of the tendo Achillis, and calcaneal spurs on the under surface of the os calcis. These spurs, however, rarely if ever appear so early in life. Tenosynovitis is easily distinguished by the presence of the tendon crepitus and pain referred to the tendon itself. There is also the condition where the bursa between the tendo Achillis and the skin of the heel is irritated from shoe pressure, which has to be differentiated. The *x*-ray will usually clear up the question at once, but even without this the condition is fairly characteristic.

The *x*-ray findings are of interest and are practically constant whenever the ossification of the epiphysis is sufficiently developed to show the characteristic changes.

There is always to be seen in comparing the plates of the two feet an enlargement of the epiphysis itself on the affected side, both in thickness in the anteroposterior plane and also in length from top to bottom. There is also considerable cloudiness along the epiphyseal line between the epiphysis and the os calcis, suggesting a deposit of new bone, and often with a partial obliteration of this epiphyseal line. These findings are typical and constant, and never occur in any other condition. Often the condition suggests a slipping of the epiphysis, with the customary inflammatory reaction following such a condition, or epiphysitis. Similar conditions existing in the tibial tubercle have been spoken of as Schlatter's disease.

In differentiating this condition from tuberculosis, it must be remembered that tuberculosis generally attacks the anterior portion of the os calcis, does not lead to bony atrophy, and is usually unilateral.

The treatment is usually simple, easily applied and carried out. There are two indications to be met, namely, to relieve the strain on the tendo Achillis, and to prevent undue weight-bearing on the heel.

For the purposes of relieving the tendo Achillis, which is attached in part to the epiphysis, the heel of the shoe is raised one-quarter to one-half inch, and the stiff counter of the shoe is removed to prevent any pressure. Strapping the heel with several vertical strips of narrow adhesive plaster, extending around the heel and well up the leg on either side, gives great relief and support. If there is much element of pronation present an eighth-inch lift is put on the inner edge of the heel to tip the foot out slightly.

To prevent pounding of the heel in walking, a rubber heel is fitted to the shoe, and a pad of sponge rubber is put inside the heel of the shoe to make a soft elastic pad on which the heel may strike. In connection with these procedures hot and cold douches applied daily, electric light baking, and rest are of great additional help.

The duration of the condition varies greatly. There may be a complete cure in a few weeks, but more often the condition persists for several months and may recur at a later period of growth before puberty following overuse or injury under unfavorable circumstances. Ultimately, however, the condition is cured by the fusion of the epiphysis with the os calcis.

Apophysitis of the os calcis is not an unusual condition. It may occur from muscle strain in rapidly growing children. It may occur less frequently from direct trauma, but presents then the same clinical picture. It never occurs after puberty. The treatment is rest and protection. The cure in all cases may be arrived at eventually.

TREATMENT OF TUBERCULOUS GLANDS OF THE NECK IN CHILDREN.

SUTCLIFFE (*Practitioner*, May, 1912) in considering the treatment of tuberculous glands in children, more especially those of the neck, calls attention to the fact that in a very large number of cases there exists a probability of spontaneous cure, if suitable surroundings are provided and the causes of irritation removed. Perhaps the greater number of the infections of child-

hood follow tonsillar and pharyngeal disturbances, and, though it is doubtful if more than a small proportion of these are primarily tuberculous, it is quite certain that the enlarged glands which follow an attack of tonsillitis furnish a very suitable soil for the propagation of tubercle, and that, unless the child is removed to healthy surroundings, and the possibility of further infection diminished by the removal of the infected tonsils and clearing the naso-pharynx, they will soon be typically tuberculous.

It is at this stage, before the caseation has taken place, that the general hygienic treatment is successful. When glands have existed for more than six months it is probable that caseation has already begun, and that operation will sooner or later be called for, though it is true that even when glands have existed for a much longer period they may still disappear. The essential point in the treatment is that sufficient rest should be given to the patient. The ideal method in the larger number of cases is to put the child to bed on a veranda with a good sunny aspect and to keep him there night and day, until the glands are definitely diminishing in size. But for the ordinary case, the usual practice is to send the child out-of-doors all day in a spinal chair. The head and neck are kept as still as possible, and bandaged firmly over a large pad of absorbent tissue. The observation of children treated with and without tuberculin has revealed no perceptible difference in the rate of absorption of affected glands, whatever its effect on the opsonic index may have been. In those young children who show an extraordinary susceptibility a dose of 1/50,000 of a milligramme, increased after two weeks up to 1/25,000 of a milligramme, does not seem to be followed by any bad symptoms. The dose is administered hypodermically, and is given every eight days, preferably in the evening when the child is about to be put to bed. Larger doses are apt to produce a considerable local reaction, which very often brings suppuration in its train.

In children practically the only cases which require operation are those in which suppuration has already taken place. Soft, large glands, especially when painless, and small hard ones can safely be left alone. The former, if due to enlarged tonsils, will in most cases disappear with the removal of the causes of irritation; the latter are firmly encapsulated and do little or no harm.

Where sinuses exist, as the result of the bursting of a superficial collection of pus, an operation is usually called for to remove the deep-seated gland that is the cause of the trouble. Several such cases have come under the writer's care after prolonged vaccine treatment, and have healed rapidly after the removal of the focus of disease. In the case of boys of ten years and over operation can more readily be recommended, as the presence of the glands is often a bar to his remaining at a public school, or presenting himself for examination for the navy. Quite young infants are sometimes the subject of very troublesome forms of gland infection, most probably caused by milk infection at the time of the first dentition. In these, whole groups of glands are rapidly affected and quickly suppurate. Usually, one of the most superficial glands has either burst or been opened before the case reaches the operator, and some weeks often have to be spent in improving the child's general health before an operation for removal of the entire affected area can safely be undertaken.

There is considerable risk in the operation, for which a skilled anesthetist and a rapid operator are alike essential. The incision should be made in the creases which run more or less obliquely across the neck. In the larger cases, in which an exposure of the whole length of the internal jugular vein is needed, the surgeon will find if he is prepared to take a little extra trouble that two parallel incisions, the upper one in the fold before referred to, the lower a little above the clavicle and curved slightly upward at its posterior end, will afford quite sufficient room for the efficient removal of glands, and leave an immeasurably superior cosmetic result than any of the flap operations formerly employed. These transverse,

or rather oblique, scars fade away into something very nearly approaching invisibility, a factor of very considerable importance both to the patients and their relatives.

In the smaller cases, in which a bulging, fluctuating swelling presents under the angle of the jaw, in front of or over the sternomastoid, with a thickening to be felt beneath it, the pus may be contained in a disintegrating superficial gland. But often what appears to be a gland is only a bag of pus connected with the caseating glands beneath, through an opening that it has made in the cervical fascia. The treatment called for does not differ from that followed when the glands themselves are obviously the seat of the suppuration, for when one is broken down its fellows are certainly infected, and the entire corresponding area should be cleared out.

The details of the operations for glands are simple enough, but their satisfactory performance through a small incision makes considerable demands on the operator's skill. A firm sand-bag having been placed under the neck and the head turned to one side, the incision is made, as a rule, through the lower of the two folds in the skin that runs obliquely from the middle line. In the first instance it need not exceed an inch and a half in length. Both edges are freed from the platysma and the fascia beneath for half an inch or more to insure mobility, and the upper edge is then dissected up as far as the upper border of the swelling, taking care not to puncture it. The branch of the facial to the lower lip is carried up, when the fascia is divided, out of the way of the knife, and a disturbing deformity is thus avoided. Retracting forceps are then placed on each side and the upper one drawn well up toward the angle of the jaw.

At this stage, if there is present one of the bags of pus already referred to, as much of its wall as possible should be removed and its cavity well wiped out with a dry swab. If there is a definite gland presenting, its posterior edge will certainly go beneath the sternomastoid, and the border of that muscle is the next thing to be defined. When the muscle is spread out over a bulging gland, the border is found much more forward than would be expected; but when, as is often the case, the bursting of the gland has taken place through the substance of the muscle, unless the real anterior edge be picked up, the surgeon will be undesirably uncertain as to his whereabouts. For this reason the original incision is carried well forward of the muscle, and the fascia is picked up and divided from the anterior end of the incision till the border of the muscle is reached, which is then freed from the glands beneath with the gloved finger as far as convenient in all directions. With the muscle then well retracted and the edges of the wound drawn out of the way as required, sufficient exposure can be obtained for the safe delivery of all the glands in the anterior triangle, and most of those in the posterior. The length of the incisions, and the consequent size of the scars, will depend on the trouble the surgeon takes in obtaining proper retraction.

Either the upper or lower group of the glands is now seized with forceps, and its removal proceeded with. If the dissection is begun from above, it is best to free the anterior margin of the gland, as the facial vein can then be seen and avoided; when traced downward, it is a guide to the position of the internal jugular. The glands are then gradually freed from surrounding structures by dissection with the point of a sharp knife, care being taken to remove the capsule with the gland. At the upper border of the group the presence of the digastric fibers, passing downward and forward, warns the operator that he is nearing the region of the internal jugular vein, and, still more important, the spinal accessory nerve. This is put on the stretch when the sternomastoid and glands are pulled upon, and is liable to be injured if the knife is used on the muscular side of the glands. It is safe, if two golden rules are adhered to—always to cut directly on to the gland, and to make sure of a good light. Injury to the vein can always be avoided if the case is being operated on for the first time, and if its connections are unobscured by

bands of cicatricial tissue. As the glands are freed, they are pulled out as far as possible in one mass, but it will usually be found that a few, in intimate relationship with the posterolateral aspects of the internal jugular vein, will require removal separately. They require careful dissection, but no case is completely dealt with unless the vein is seen quite clear on its outer aspect in the whole field of view. If it be decided to begin the dissection from below, the lowermost gland is seized with the gland forceps, and the mass peeled upward off the vein by light touches of the knife on the under surface of the capsule. This is adherent to the sheath of the vessels, and the vein falls away readily as touches are made on the fascia connecting them.

Glands in the submaxillary region are easily removed through a comparatively small incision, but there are always two or three in intimate relationship with the salivary glands, which must not be overlooked. Glands in the upper part of the posterior triangle—that is to say, those above the spinal accessory nerve—are dealt with by prolonging the original incision backward over the sternomastoid. The posterior border of the muscle is then lifted up and held forward, the glands are seized with forceps, drawn backward, and cleared by cutting on their superficial surface till they are freed from their attachments to the fascia about the vessels. The hindmost of the group is then lifted up, and the whole mass dissected forward off the muscles till the front limit of the dissection is reached.

At the present time, when cases are submitted to operation comparatively early, this incision gives sufficient room to remove glands from nearly as far down as the clavicle. It must be remembered, however, that the spinal accessory nerve is apt to run between groups of glands. When this is seen in the dissection in front of the muscle, it is best to remove the glands in three groups, those above the nerve before it enters the muscle being removed from behind it, separately from those removed by the dissection in front. A further dissection must be undertaken for the glands below its course in the posterior triangle, and for those in the subclavian triangle. This incision begins about an inch above the clavicle, at the inner border of the clavicular insertion of the sternomastoid, and extends to well over the edge of the trapezius according to the size of the group to be removed; if necessary, its tail can be prolonged upward toward the upper incision. The skin and platysma are raised from the muscles and glands beneath. The external jugular vein at the inner end of the incision can usually be avoided, and drawn forward with the sternomastoid. When this muscle is freed and raised up, the innermost of the group of glands is sought for, and is found in intimate relationship with the sheath of the main vessels. Its upper surface should be clearly seen before seizing it with the gland forceps, when a few touches of the knife will free it from the bulging internal jugular, and occasionally from the subclavian. When sufficiently freed from these structures, the finger can be inserted between the group and the veins, and the entire supraclavicular group dissected backward. When freed and lifted from the floor of the triangle, the glands along the back of the internal jugular are freed from their attachments, as far as the place where the spinal accessory crosses the space. The nerve can, as a rule, be defined, if the trapezius be pulled backward and its oblique course remembered.

If, during the operation, the spinal accessory nerve is seen to be wounded, it should be sutured at once, as there can be no question as to the unsightly deformity produced by the wasting of the trapezius, and the still greater disability if the nerve is divided on the inner side of the sternomastoid. The author has seen many instances of both types of deformity, and in some a marked spinal curvature resulted.

Suppurating glands over the parotid, in front of the ear, are best dealt with by a longitudinal incision down to the capsule of the gland; the caseous matter is then shelled out with a sharp spoon. The facial nerve lies in the substance of the parotid, and as the glands are always on its superficial surface, the nerve is in no danger if ordinary care is used.

REVIEWS.

A TREATISE ON TUMORS. By Arthur H. Hertzler, M.D., Ph.D. Illustrated with 538 engravings and 8 plates. Pp. 725, xi. Lea & Febiger, Philadelphia and New York, 1912.

From Johannes Müller and from Rudolph Virchow to Ribbert, to Borst, and to Lewin, German writers have maintained the field of scientific laboratory study of oncology. English-speaking scientists have striven to give to the profession most able dissertations on the clinical phases of tumors. The monographs by Bland Sutton, by Senn, and others have afforded abundant record of the advances maintained by observing accurate clinicians of large experience. The present appeal is largely to surgeons, one might say to general surgeons, and cannot replace many valuable treatises on special phases of tumor study at present available and embracing neoplasms of the mamma, of the uterus, of the brain, of the mouth and jaws, and of the stomach.

The volume is divided into three parts; less than forty pages is devoted to the general biology of tumors, included in a single chapter. The special pathology of tumors comprises eighteen chapters, each devoted to some particular neoplasm or group, as osteoma, sarcoma, carcinoma, and so on through the list. Part III, embracing twenty-six chapters, 495 pages, is the most bulky and on the whole the best part of the work.

In considering the general biology of tumors one is somewhat refreshed to see the admittedly time-worn theories concerning the origin of neoplasms concisely presented and cavalierly condemned. The author appears open-minded, but with a strong inclination to accept some phase of cell anatomy, based on the assumption that the causal influence lies in the cells themselves, that they are the essentially changed structures, but leaves nothing conclusive as to the basis of the change the results of which are so evident. What this intangible, indefinable influence is or has been he admits remains unknown. Classification is along beaten pathways, histogenetic in basis, less philosophic than that suggested by Adami —whose views at least might well have been incorporated—but a good working, generally applicable nomenclature; it is not more, nor can it in the present state of our knowledge be much less.

The chapters dealing with what the author terms the special pathology of tumors follow trite lines, but contain well-stated facts; the balancing does not always appear even, but this must be a matter for individual determination. Lipoma receives about one printed page; calcific nodes in fatty tumors are not mentioned. The author offers no solution for the still unsettled oncologic positions of "hypertrophied scars," keloid, Recklinghausen's disease, elephantiasis, and multiple myeloma. In a clinical work, such as the present, polemics may wisely be avoided. The chapter devoted to syphilis, tuberculosis, actinomycosis (seven lines), glanders (five lines), leprosy (two lines), rhinoscleroma, botryomycosis, and mycosis fungoides, and embracing in all less than nine pages, might well have been omitted.

Over two-thirds (495 pages) of the volume is devoted to a consideration of the regional occurrence of tumors. Here the author has done his best work, and, although a captious critic might point out minor defects, fully deserves congratulation. This part is largely clinical and abundantly illustrated. Considering the marvelous results attained in the treatment of angiomas with radium, that agent should certainly have been mentioned. In so pretentious a work it seems to the reviewer that as exact direction should be given for the use of *x*-rays as for the knife; certainly one would like to know Dr. Hertzler's opinion as to the use of massed doses, and his advice concerning the selection of cases adapted to Roentgenologic treatment. These are, however, omissions of minor import compared with the more carefully considered details of diagnosis, prognosis, and treatment with which this part of the work abounds. Facts are logically pre-

sented, adequate space is given to differentiation and the proper handling of obscure and doubtful cases.

Citations of literature are irregularly distributed through the text, and there is no pretense to exhaustiveness in this respect. In a rapidly advancing science a publication fourteen years old hardly merits being called recent (p. 88); many of the references are to bibliographic articles or monographs, and thereby the student is placed in touch with the literature.

Typographically the volume leaves little to be desired; the half-tone reproductions are exceptionally good, and the press-work and binding of excellent quality.

W. M. L. C.

STOMATOLOGY IN GENERAL PRACTICE. A Textbook of Diseases of the Teeth and Mouth for Students and Practitioners. By H. P. Pickerill, M.D. The Oxford University Press, New York, 1912.

This volume of about two hundred and fifty pages is well described in its title. It is copiously illustrated, and the importance of its subject is emphasized by the motto which opens the preface, to wit: "He that keepeth his mouth keepeth his health." Within recent years the importance of cleanliness of the mouth in relation to the development of disease has become more and more emphasized and is now well recognized. Altogether there are seventeen chapters and three appendices. The author discusses the development, anatomy, and physiology of the teeth and adjacent structures, deformities of the teeth and jaws, and inflammatory conditions of the mouth. He then takes up inflammations of the gums, caries of the teeth, and the preventive treatment of caries. The surgical treatment of dental disease and the fractures and dislocations of the jaws follow. There is also a chapter on oral tumors and another upon the manifestations of systemic diseases in the mouth. The fifteenth chapter deals with oral sepsis and its effects, and the sixteenth with oral disease in relation to various lesions of the nervous system. The last chapter deals with local and general anesthesia. The first appendix deals with the methods of examining the mouth, the second gives formulæ which are useful in treating diseases of the mouth, and the last appendix deals with dental instruments. This appendix, however, is of very little value and is based upon an English instrument catalogue. To those who are interested in stomatology, either as dental practitioners or as general practitioners, this book can be cordially recommended.

A TEXT-BOOK FOR NURSES. Including Anatomy, Physiology, Surgery, and Medicine. By E. W. H. Groves, M.S., F.R.C.P., and J. M. Fortescue-Brickdale, M.A., M.D. The Oxford University Press, New York, 1912.

In the four hundred large and closely-printed pages of this volume the authors have managed to include an immense amount of valuable information which is not only useful to the nurses for whom it was prepared, but which also will prove of value to many practitioners, both old and young. At first glance one would presume that it would be impossible to deal with so many broad topics in one volume, and it goes without saying that many departments are necessarily brief. In nearly every instance, however, the salient and important points are adequately considered. The book is handsomely printed on heavy paper, and has so many concrete statements in its pages that we intend to keep it rather than present it to any nurse. While some of the illustrations and some of the text deals with matter which can scarcely be said to concern nurses, as, for example, syphilitic disease of the skull and tuberculosis of the joints, and while many of the illustrations are taken from standard works on surgery, these illustrations nevertheless serve to make clear to the general practitioner as well as the nurse steps which are followed by the surgeon in his operative work.

TRAITEMENT DE LA TUBERCULOSE. Par Albert Robin. Troisieme Serie. Vigot Freres, Editeurs, Paris, 1912.

Rightly or wrongly English and American physicians have within recent years come to look upon many of the French contributions to therapeutic literature as being somewhat unreliable, probably because not infrequently the French therapeutist seems

to be extraordinarily optimistic as to what drugs can accomplish, but in these days, when there is such a vogue for the climatic, hygienic, or sanatorium treatment of tuberculous patients, it is rather refreshing to find so competent a therapeutist as Robin bringing forward the drugs which can be used with advantage in association with other measures. While it is doubtless true that in the past tuberculous patients were drugged to a degree which amounted to an abuse, it is equally true that much comfort and help toward getting well can often be given the patient by the sensible use of well-chosen remedies. Although the enthusiast who is in favor of remedial measures other than drugs in tuberculosis may scoff at many of the recommendations which Robin makes, the book nevertheless contains a good deal of valuable and reliable information.

KIDNEY DISEASES. By W. P. Herringham, M.D., F.R.C.P. With Chapters on Renal Diseases in Pregnancy, by Herbert Williamson, M.D., F.R.C.P. The Oxford University Press, New York, 1912. Price $5.50.

It is evident from the title of this book that it deals with strictly practical material. The opening chapters deal with the normal and abnormal anatomy of the kidney, with its physiology and with the pharmacology of drugs which affect this organ and with the normal and abnormal constituents of the urine. The following chapters are taken up with the methods of urinary analysis, with hematuria and hemoglobinuria and dropsy. Following this there are chapters upon the various forms of nephritis and its treatment, the cardiovascular lesions which are associated with nephritis, and other chapters dealing with renal diseases which do not come under the heading of acute or chronic degenerative changes in these organs—such, for example, as cystic kidney, pyelitis and pyelonephritis, and tumors. The special chapters dealing with the kidney disease in pregnancy are particularly interesting and important, as they take up the association of hepatic lesions, the dangers of renal complications, and the methods by which they should be treated. As we have already stated, the character of the text is distinctly clinical. Numerous excellent illustrations showing pathological conditions are given, and a fair bibliography is appended to each important chapter.

TUBERCULIN TREATMENT. By Clive Riviere, M.D., F.R.C.P., and Egbert Morland, M.B., B.S., M.D. The Oxford University Press, New York, 1912. Price $2.00.

This excellent little manual, which brings the subject of tuberculin therapy up to date, will doubtless prove of interest to a large number of readers, as it not only gives directions as to the administration of tuberculin and the objects which are to be attained by its use, but specific directions as to the tuberculous conditions in which it can be expected to do most good. If the book by being widely read will serve to impress the general practitioner that he should not use tuberculin unless he has had some special training in its employment it will do much good. If it serves to encourage the general practitioner in the use of this very active substance so that he will give it in haphazard fashion it will do much harm. However, we think that any one who reads the text with care cannot fail to be impressed with the fact that this agent is one which possesses power, and that no one can afford to abuse it.

MATERIA MEDICA AND THERAPEUTICS. An Introduction to the Rational Treatment of Disease. By J. Mitchell Bruce, M.A., LL.D., M.D. Assisted by Walter J. Dilling, M.D. Ninth Edition, Revised. Cassell & Company, New York, 1912. Price 6/6.

Bruce's little book, which is small enough to go into the pocket, yet covers nearly 650 pages, is a condensed manual of Materia Medica and Therapeutics in which important points are emphasized by the use of heavy-faced type. It is surprising how much information the authors have been able to condense in so small a space. The junior writer has endeavored to bring this the ninth edition up to date, and has succeeded admirably in almost every respect. When we remember that this edition makes the "fifty-fourth thousand" it will be seen that the text must contain material which has been found valuable both by students

and practitioners. The senior author, who was a lecturer on Materia Medica and Therapeutics at the Charing Cross Hospital, London, for many years, has always been an eminently practical clinician, and therefore the clinical side of therapeutics is well to the front in the text of this and the other editions.

THE HEALTHY BABY. The Care and Feeding of Infants in Sickness and in Health. By Roger H. Dennett, M.D. The Macmillan Co., New York, 1912. Price $1.00.

As this little volume is dedicated by the author to his three children, it is evident that he has had personal experience not only as a physician but as a father, and this personal experience, therefore, possesses a double value when it is put in type for the use of other practitioners. The book does not seem to be designed for medical men, but rather for the use of the mother and nurse. The language is simple, easily understood, and the directions given are admirably practical. The physician can advise his nurse or patient to scan its pages, and will feel sure that the results will be advantageous.

BLOOD-PRESSURE TECHNIQUE SIMPLIFIED. By W. H. Cowing, M.D. The Taylor Instruments Co., Rochester, N. Y.

The object of this little book is well described in its title. As it covers only a little more than 100 pages it is evident that it is not exhaustive. While some of the recent literature upon this important subject has scarcely received the attention that it deserves, nevertheless to those who are beginning to use the sphygmomanometer in their practice this manual will, without doubt, prove useful.

THE ESSENTIALS OF MORBID HISTOLOGY. For the Use of Students. By Albert S. Grünbaum, M.A., M.D., F.R.C.P., D.P.H. Illustrated with Colored Plates and Black and White Drawings. Longmans, Green & Co., New York, Bombay, Calcutta, and London, 1912.

The colored plates in this book are exceedingly good, and the black-and-white drawings are also worthy of much praise. We know of none better. They are neither too diagrammatic, on the one hand, nor too minute as to detail on the other. The volume does not profess to be an exhaustive one, but is based upon Schäfer's Essentials of Histology, which the student is assumed already to possess and to know. Many illustrations are original. In dealing with the cells and cell degenerations the text takes up circulatory disturbances, injury and repair, the various forms of inflammation, atrophy and hypertrophy, new growths, and then diseases of the various organs, the muscles, and the nervous system. The book is one which can be read with much pleasure and profit by the busy practitioner who has not time to peruse an exhaustive volume upon this subject, but who wishes to refresh his memory as to facts in clinical pathology.

LA PRATIQUE DE L'OPOTHERAPIE. Principes, Indications, Posologie. Par M. L. Hallion. Masson et Cie, Editeurs, Paris, 1911.

Although Hallion possesses all the therapeutic enthusiasm and optimism which is characteristic of the French, he nevertheless presents many facts in connection with opotherapy which are of value. As the book is in the French language it unfortunately will not prove useful to American practitioners as a rule, but to those who read French and wish to obtain a brief summary of opotherapy as it exists to-day it will prove of value, if for no other reason than that it will give them a clue to other more extensive literature.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures. Edited by Henry W. Cattell, A.M., M.D. The J. B. Lippincott Co., Philadelphia, 1912. Volume II. Price $2.00.

We have so often reviewed previous issues of the International Clinics and described their scope that it is not necessary to give the information again. There are more articles than usual in the present issue. One of them is an excellent presentation of the management of sunstroke, a lesson in hydrotherapy, by Dr. Simon Baruch. Another is on so-called Spondylotherapy, by Dr. Albert Abrams, of San Francisco, and there are others upon headache, poliomyelitis, neurology, and a symposium upon anesthesia that covers nearly fifty pages. This issue well maintains the standard set by its predecessors.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month sees the inauguration of the much-discussed, much-abused National Health Insurance Act. Although contributors will have to begin making their payments at once, the benefits will not be available before the beginning of next year. Thus the Chancellor will have six months in which to complete his negotiations with the doctors. Even at this late stage every one is vague as to the exact point reached in these negotiations, but apparently the representatives of the profession are persisting in their programme and refusing to be satisfied with anything less than their original demands. In some districts all of the physicians have handed in resignations of their positions as doctors to friendly societies, clubs, and dispensaries, to take effect on December 31. In some areas the resignations have been accompanied by the announcement of a public medical service to be managed and controlled by the doctors themselves. This service will not, of course, be called into being if satisfactory terms are arranged between the Insurance Commissioners and the British Medical Association. The Chancellor has recognized to a certain extent the claims of the doctors for better remuneration in that he has appointed an independent actuary to investigate the accounts of various club doctors in different towns and districts in the country. It is hoped that by these means the Chancellor may be convinced that the remuneration he has been offering is quite inadequate when compared with the time and labor which must be expended if insured persons are to be treated with reasonable skill and care.

The Board of Agriculture has just made announcement of the discovery of outbreaks of foot-and-mouth disease in several different localities. Most of the infected cattle have been found in districts close to Liverpool, which is the chief port of landing for Irish cattle. The source of infection has apparently been found in a farm close to Dublin, and in consequence all the English ports have been closed against Irish live stock. This announcement has caused consternation among the cattle traders in Ireland, for that country has been free from the disease for nearly thirty years, and the trade is in a most flourishing condition. Many markets have already been closed, and the Royal Show to be held shortly at Doncaster will be denuded of many of its classes, if indeed the show can be held at all. The spread of cattle plague through the country would be such a national calamity that the most stringent measures taken by the Board of Agriculture to prevent its spread will receive the general support of the community.

The value of travel as an educational factor is becoming far more widely recognized, and the conference recently held by the Association for the International Interchange of Students has emphasized one method by which this form of education can be utilized. The association is endeavoring to establish permanently a bureau to promote educational travel, and in time it hopes to develop the facilities for the international exchange of professors. The exchange of professors, though naturally more difficult to arrange than the exchange of students, is a measure that would probably have considerable influence on our universities and would tend to lessen those insular prejudices which have by no means yet disappeared.

The metropolitan borough of Paddington is trying a new experiment in the laws for sanitation. It has passed by-laws requiring every tenement lodger to sweep his floor every day and to thoroughly wash his room at least once a week. In addition to this every room used as a sleeping-room must have its window opened for one hour at least every morning and afternoon. It remains to be seen if these drastic by-laws will have much effect on the health of the borough; at present they are more honored in the breach than the observance. We feel that it will take more than the threat of a

£5 fine to make those people who are really afraid of draughts to open their windows during the daytime, and as there are only two sanitary inspectors in this thickly populated borough the lovers of stuffy rooms will probably be able to defy the law for many a long day to come.

The Metropolitan Asylums Board has been obliged to ask for increased estimates this year. Part of this is due to the increased cost of coal and provisions, which have all been unfavorably affected by the labor troubles of the past year, but we regret that part of this expenditure is due to the necessity for making provision for an increased number of lunatics. Although the general health of the community has been improved and the death-rate lowered by the administration of the sanitary laws, the number of mental cases does not decrease, and of late there has been a steady increase in the number of lunatics in our public asylums. The struggle to obtain a livelihood has become so keen that many minds of unstable balance give way under the strain.

A great Congress of all the Universities of the Empire is now being held in London. Delegates have arrived from the fifty-four universities of Great Britain and the universities' dominions. They comprise great scholars, experienced organizers, and many famous public men; indeed, every kind of talent in the seats of higher education throughout the empire will be represented. The subjects for discussion comprise all questions of practical importance in university work, and each problem as it arises will be introduced by the men who have the greatest authority on that particular subject.

The Housing of the Working Classes Bill has succeeded in finding its difficult way through committee and has now been reported to the House of Commons. This bill is likely to prove a useful measure, but unless the government takes it under its wing and stars it for preferential treatment it is not likely to reach the Statute Book this session.

Trinity College, Dublin, has recently been celebrating the bicentenary of the foundation of her medical school, and right royally were we entertained there. Numerous receptions were held by the College, the College of Physicians, and the Chancellor of the University (Lord Iveagh). We were also entertained to dinner at the graduates' banquet July 4, and by the Provost and Senior Fellows July 6. At the first of these two dinners there were about 500 present, and at the second about 300. Congratulatory addresses were presented in the morning of July 5. These came from universities and colleges in Great Britain, the continent of Europe, America, India, and as far away as Japan. Sir William Osler presented that from Oxford University, and some amusement was instilled into the proceedings by the orchestra striking up Yankee Doodle, which produced a smile and wave of the hand from the Regius Professor. The addresses were received by the Chancellor and Provost. Some of the visitors went over the large works where the celebrated stout is produced, and were afterward lunched in the same buildings, and I understand that some of them afterward found the return journey to Holyhead not so pleasant as they had anticipated. Memorials were also unveiled to Stearne, who did so much for the College in the early days, and to Professor Cunningham, the anatomist, who spent a large part of his life in Trinity College before going on to Edinburgh. Honorary degrees were also conferred on some of the distinguished guests. At all these festivities academic costume was worn, and Dublin presented a very bright appearance. Trinity College is situated in the very heart of the city; it consists of commodious buildings around a central grass lawn, which is large enough to contain a good-sized sports ground, is also well endowed, and has a great future before it. Merrion Square, the residential quarters of the fashionable medical practitioners, is near-by, so that the staff are also lucky in being close to their work. I am sure all the delegates had a most pleasant holiday and are much beholden to the authorities for their kindness and for the admirable arrangements which were made for their comfort.